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# The Mining Journal

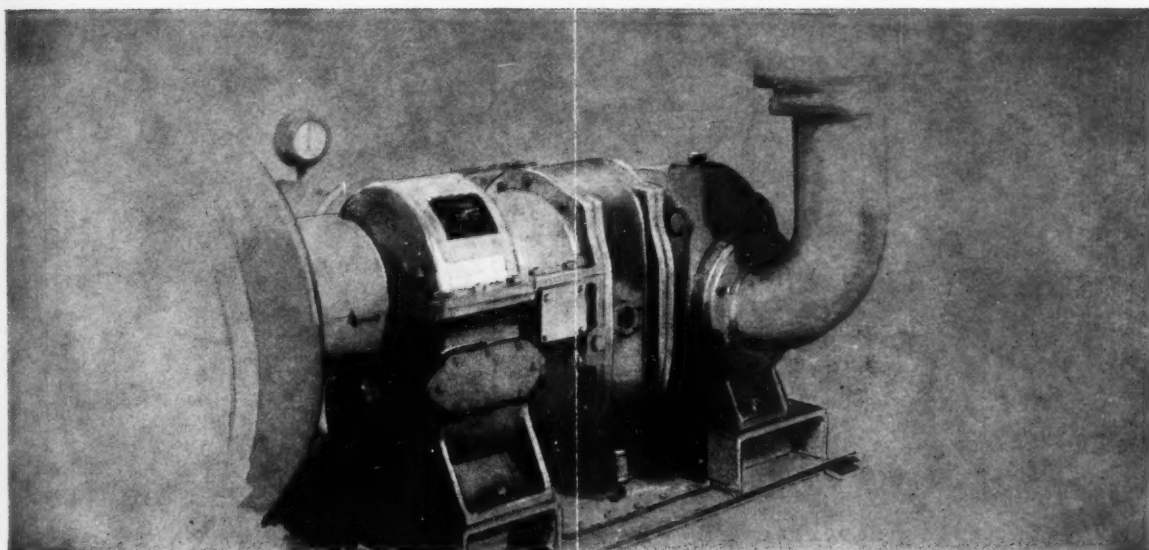
LONDON, MAY 6, 1960

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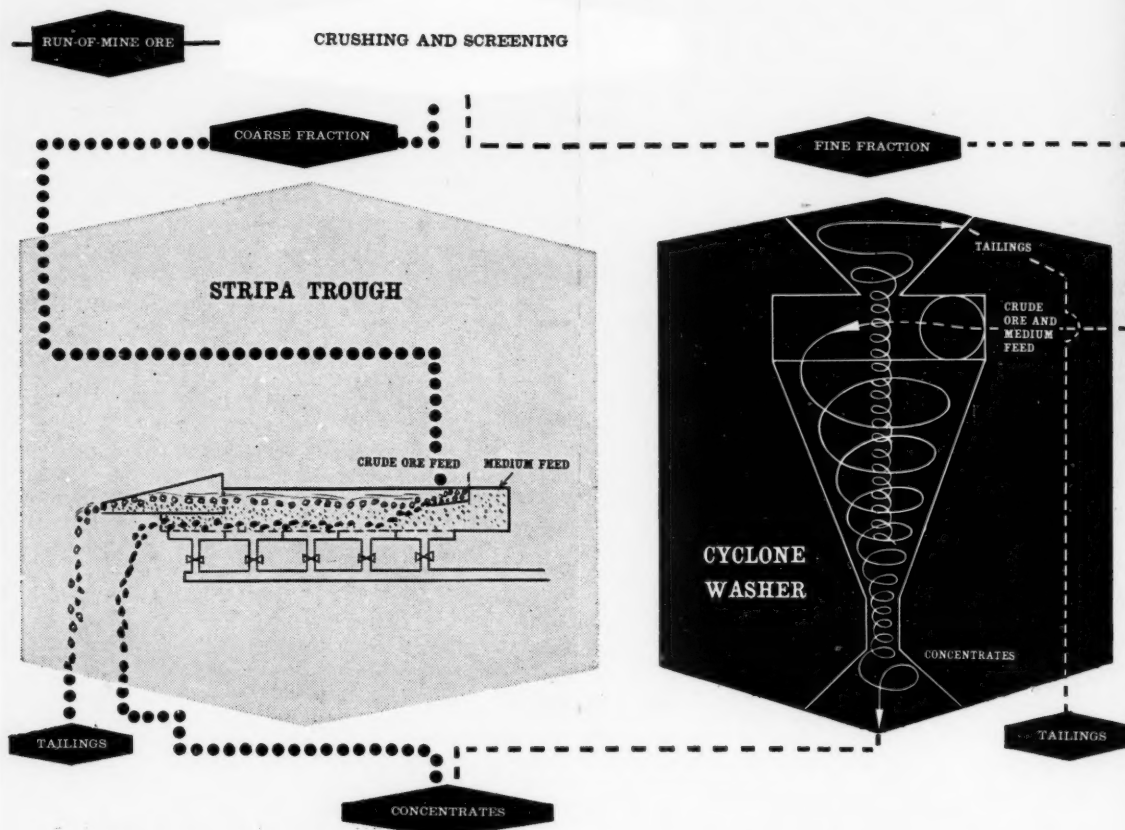
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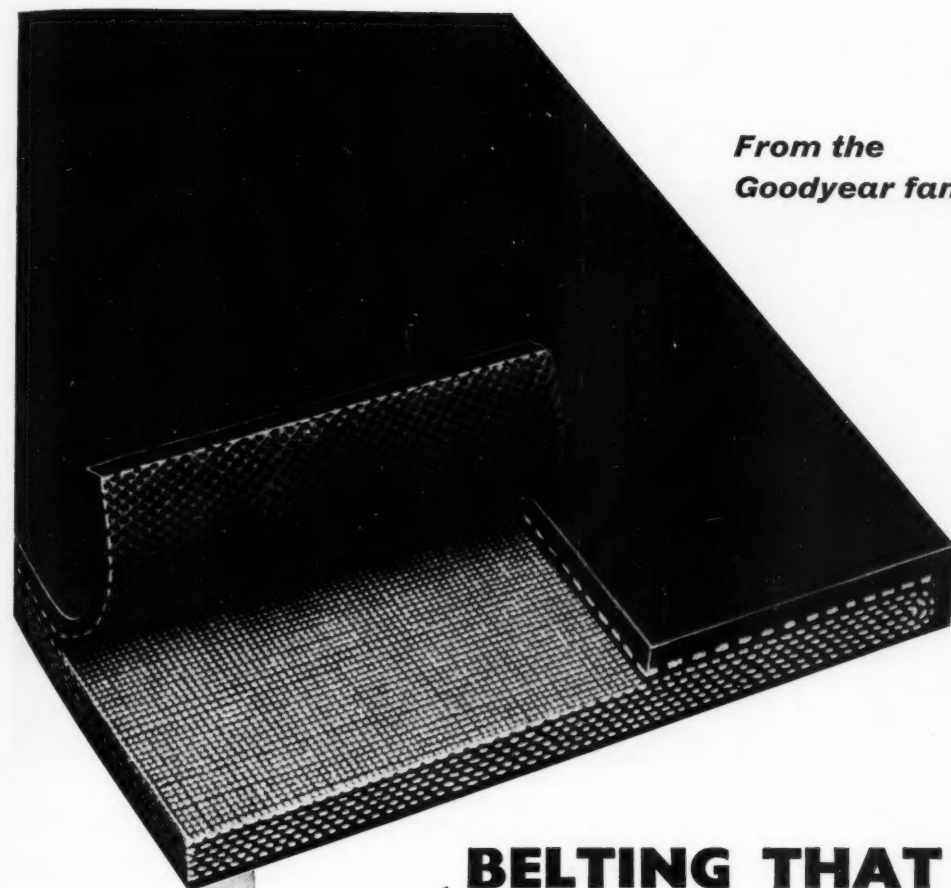
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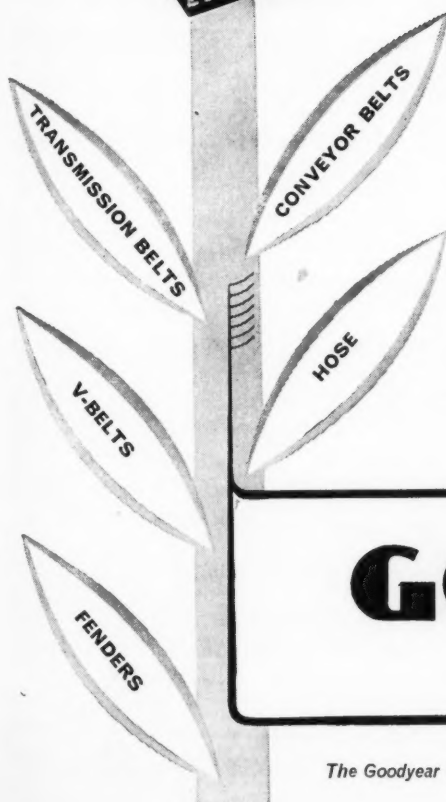
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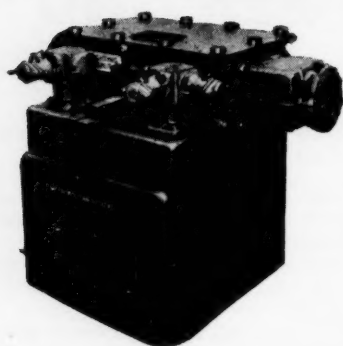
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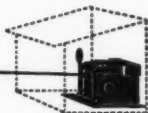


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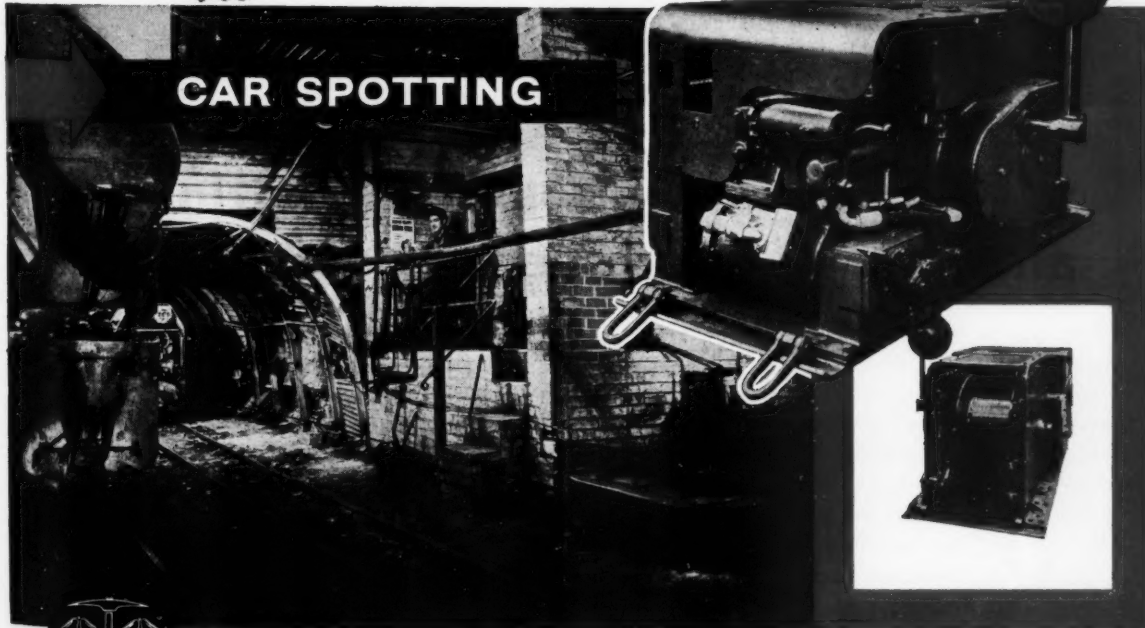
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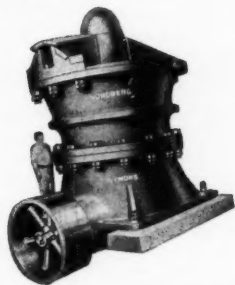


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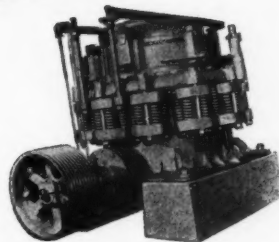
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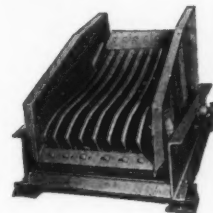
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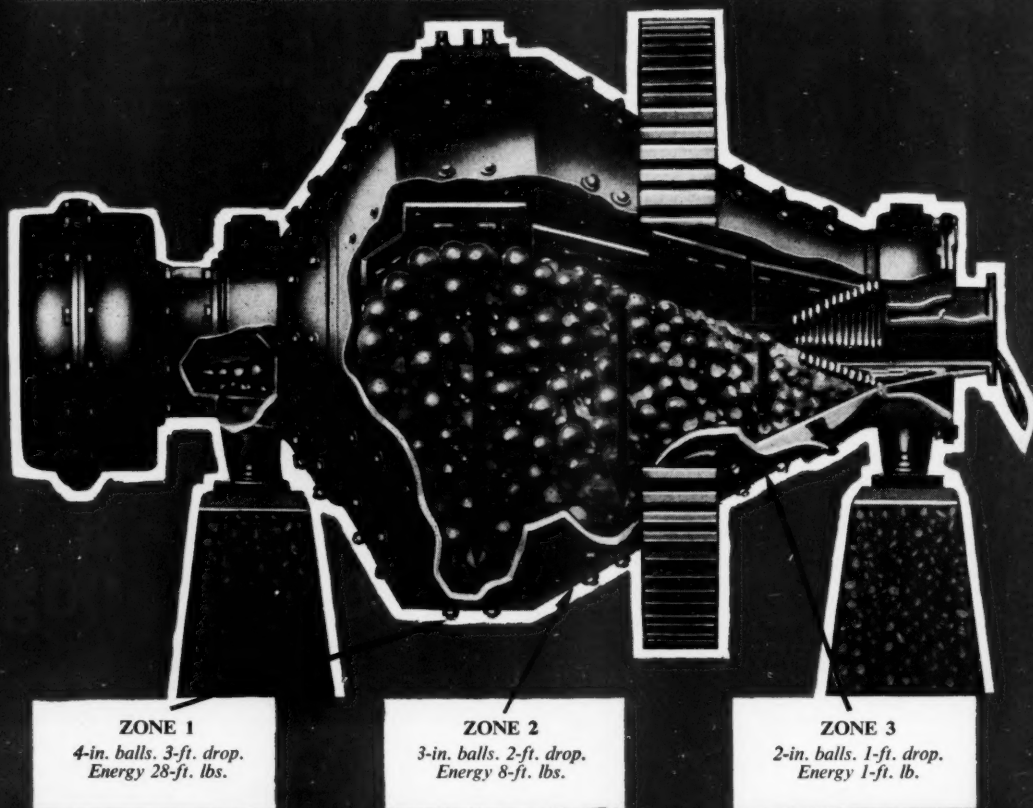
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# The Mining Journal

London, May 6, 1960

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Editor  
U. Baliol Scott  
Deputy Editor  
A. Graham Thomson  
Assistant Editor                      Assistant Financial Editor  
R. Bowran                              R. A. Nuttall  
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## The Tin Agreement Under Review

INVITATIONS have now been despatched to a conference beginning in New York on May 23 which is to discuss the future of the international tin trade when, in midsummer 1961, the present agreement runs out. Along with them has gone a draft of a new agreement prepared by the International Tin Council. This draft in itself disposes of one question—whether the members of the existing agreement could so sink their differences as to urge the adoption of a fresh scheme. That at least they have done. But the draft should properly be seen as little more than a framework around which discussions may be held; and when, later this month, the conference assembles in New York there is little doubt that dissenting views will soon be apparent.

It will be, of course, a United Nations, and not an International Tin Agreement, conference. This means that all United Nations members will be eligible (and that includes the U.S.A. and the U.S.S.R.) and that they will all have a single vote when it comes to the taking of decisions. It will also mean that West Germany, a significant consumer, and China, a significant exporter, will still be ineligible to take a share in the discussions. In fact one can fairly confidently predict that the first move the Russians will make will be to suggest that China should be admitted to the conference.

Russia's second move is a good deal harder to guess. Russia belongs to none of the United Nations commodity stabilization schemes. She has consistently condemned them as devices for exploiting the primary producing countries. Her attitude has not been a grave inconvenience since Russian membership has never appeared vital to any one of them. Russia's absence from the I.T.A. caused no great concern when the first agreement was written because up till that date she had not appeared as a tin trader of any great note. However, since then she has shown a tin exporting capacity sufficient to threaten the agreement and second thoughts will be necessary. It by no means follows that second thoughts will be different. Would Russia be a welcome member of a new agreement? That depends on her attitude to it. Unless it is one of whole-hearted co-operation (and that she has never shown) it might yet be a better bet to rely on benevolent neutrality. (See also article on page 517.)

For not too dissimilar reasons it might be best to rely on benevolent neutrality from the United States as well. There are altogether too many Americans with a pathological distrust of the international tin trade for American membership of any new agreement to be wholly comfortable. Let it also be remembered that, if the United States were to join, she would have a dominance among the consumer voters such as is enjoyed by no country at the moment. All this is not to say that every endeavour should not be made to accommodate the Americans and Russians; it means only that if the endeavours fail it need not be a complete disaster.

However, whether the Americans join a new agreement or not, it will be instructive to have their views on the operation of the old

one—and particularly on the operations of the buffer stock manager.

This is a matter taken up by A. Strauss and Co. in their monthly review for March and referred to again in their April number. Both issues comment on the effect on tin prices of the dealings of the buffer stock manager in recent months. For some time now he has had authority to deal in the middle tranche. That is worrying enough, for the tranches themselves have been reduced from an original £80 to £50. In fact, the buffer stock manager has not permitted anything like the spread of £50, and over a long period he has kept prices within a spread of about £10 or less. Indeed it is only within the past fortnight that he has withdrawn from the market, and only at this week's meeting of the I.T.C. that his authority to operate in the middle tranche has been withdrawn as from the end of next month. (Other decisions at the I.T.C. meeting are reported on page 527.)

This raises two questions. One is the matter of principle as to whether it is right that such a fundamental change in the operations of the buffer stock manager should be allowed within the lifetime of the agreement. The second is whether the actual change made is a good or necessary one.

To the first question there should be an unequivocal no. Of course there must be room to make adjustments—even in any new agreement and there certainly had to be scope to make them in the pioneer agreement. But "adjustments" should not be stretched to mean changes that alter the fundamental nature of the agreement itself. For that a special procedure should be devised.

The second question is a more difficult one. Why in fact was middle tranche dealing necessary? The third annual report of the I.T.A. which has recently become available gives one answer. It was "to ensure a degree of protection for the consuming countries in the event of export control resulting in a temporary shortage of tin and in an undue rise in market prices". This however, seems slightly disingenuous. It would certainly explain why the buffer stock manager has sold in the middle tranche; but in fact it is well known that he has bought as well.

It will be news to consumer countries that middle tranche buying is for their protection while export controls are in existence. Furthermore there is a great deal of difference between avoiding an "undue" (whatever that may mean) rise in price and avoiding any rise in price at all. Rightly or wrongly, the action of the buffer stock manager is widely attributed to a realization of what the United States will and will not stand in the matter of tin price movement. It will be helpful if, at the forthcoming conference, we get some enlightenment on what the United States now expect a buffer stock to do.

Is the L.M.E. in danger of being killed by the buffer stock manager? It is hard to say. But we ought to take notice when leading dealers assert that this is so. Undoubtedly, professional market dealers have an interest in some degree of price movement. Nevertheless even though the dealer admittedly serves his own interest, he exists primarily to serve others and if he did not he would not get the business to keep him going. Of course there are attractions in the price stability of, say, aluminium. But so long as tin is produced in so many countries by so many mines it is hard to see how it can be sold in any way other than through a market; and if there is to be a market it is best made efficient by professional operators. If the Americans want the consequences of an international cartel they should come out in the open and say they want the cartel too.

Whether we market tin by international agreement or by international market is not, however, the real question. So long as we have a choice, matters are not out of hand. But what if the agreement were so run as to put the L.M.E. out of business and then itself collapsed? That is by no means impossible. Even the most fervid defenders of the I.T.A.

could not say that it represents a permanently assured method of marketing the metal. And until it does, it would be the height of folly actually to jeopardize the L.M.E. Nobody throws away his belt when his braces are hanging on to rather insecure buttons.

## THE IMPLICATIONS OF STEEL EXPANSION

The fantastic rise in steel production, not only in the U.K. but also in most of the major manufacturing countries of the world, has given rise to a more active exploration of potential sources of iron ore and the possibilities of their commercial exploitation. Yet, therein lies the snag. From the Arctic to the Sahara limitless resources of ore are in sight, but their accessibility remains the determining factor; for their development demands the expenditure of huge capital resources, not only upon mining equipment but also upon means of transportation from the mines to the loading ports and thereafter upon ocean shipment. Hence the change—and a momentous change it may well prove to be—that has just been announced in the financial structure of the British Steel Corporation.

Heretofore the proportion of home iron ore used in British blast furnaces has exceeded the tonnage of imported ores, but the disparity between the two has been steadily declining throughout recent years and in a special survey prepared three years ago the Iron and Steel Board indicated that the gap would be bridged entirely. It was then estimated that the ore requirement for the 19,000,000 tons of pig iron expected to be produced in 1962 on the basis of schemes already approved by the Board would be; home ores 21,000,000 tons; imported ores 22,000,000 tons.

These figures, of course, have been wholly vitiated by subsequent events and although the steel companies in the Midlands have embarked upon big developments of the principal home sources of iron ore, British steel must perforce look beyond its own shores for its ore supplies.

Inevitably steel industries find themselves compelled to look further afield for their own supplies. In both the United States and the E.C.S.C. countries, the proportion of pig iron production based on imported ore is increasing rapidly, and acceptance of this rising trend is implicit in the decision of nine of the principal steel producers, in conjunction with the British Steel Corporation, to control investments in overseas mining enterprises. (*M.J.* April 29, page 504.)

Two particular areas of investment are indicated in the preliminary announcement—Conakry in Guinea and Mauretania on the fringe of the African desert. The Conakry enterprise is nearing full maturity. It is a peninsula which the sponsors claim to be "almost entirely" made of iron ore. It offers reserves amounting to probably 250,000,000 tons of ore with a 50 per cent iron content. It is close to the seaboard and B.I.S.C. (Ore) Ltd. has secured a one-third interest, the balance of the capital being provided by the French Government and British and French private interests.

The other African, development in which the new company is directly interested, by their 20 per cent holding is the Societe des Mines de Fer de Mauretanie (MIFERMA) a £60,000,000 project in French West Africa in which (it may be a happy augury) French, German and Italian steel companies are also financially interested. MIFERMA forecasts an annual output of 6,000,000 tons of ore which is to be transported on a 400-mile rail track from the mine to a port yet to be built at Port Etienne.

Needless to say both enterprises have been closely scrutinized and their development and the formation of the company in which British steel interests are happily and voluntarily associated with the three leading members of the Inner Six offers a gleam of hope that the cleavages with the Outer Seven may ultimately be adjusted in the joint interests of both.

# TIN PRODUCTION IN CHINA AND THE U.S.S.R.

**D**EEP in the remote interior of Siberia, the Soviet Union has just opened the world's northernmost tin concentrator. To the east, in China, aggressive state planning will push tin production this year close to 30,000 tons. These events, culled from Soviet documents and reports, reflect the growing strength of Communist tin production relative to the West.

Soviet tin production is believed to have increased to 20,000 or 25,000 tons by 1958, with domestic consumption in the range of 30,000 to 35,000 tons. The sudden start of large tin exports in 1957, particularly to the Netherlands and Britain, reflected apparently both a rise in Soviet domestic output and the existence of a tin stockpile.

By 1958 Chinese production is believed to have increased to more than 25,000 tons, and China's domestic consumption to about 5,000 tons. The increased output resulted in part from the expansion of concentrating and smelting facilities at the Chinese tin centre of Koku in Yunnan Province and in part from the restoration in 1958 of the railroad between Koku and the North Vietnamese port of Haiphong, providing an easy outlet for Chinese tin.

## Recent Growth

There appears little doubt that Communist tin output has expanded in a major way since 1955, while the Free World's mine production failed to show any significant increase.

Soviet output in 1955 is believed to have been 15,000 to 20,000 tons, compared with the 1958 estimate of 20,000 to 25,000 tons. China's 1958 production estimate of more than 25,000 tons compares with about 20,000 tons three years previously. Both represent three-year gains in the region of 25 per cent.

Consumption also has expanded. Soviet use is estimated to have risen about 5,000 tons annually between 1955 and 1958. Chinese consumption probably moved up about 3,000 tons from the 1955 level of 2,000 tons.

In the first half of 1959 Western European countries imported about 6,800 tons from the Soviet Union, a rate of imports that seems to be in keeping with the 13,500-ton quota assigned to and accepted by the Soviet Union last January. Indications are that the additional amount of tin available as a result of Soviet exports is being absorbed by the market without difficulties.

Last year's orderly trade has been in sharp contrast to the Soviet Union's 1958 tin-export drive, which brought about a temporary collapse of price supports by the International Tin Council.

## New Concentrator

The growing strength of the Soviet Union as a tin producer was emphasized in November by the opening of what is probably the world's northernmost tin concentrator. It is situated at Iultin, a mining settlement in north-eastern Siberia, virtually on the Arctic Circle.

Tin mining began at Iultin in 1954, and until the recent completion of the concentrator the ore had to be shipped in crude form through the Arctic port of Egvekinot, on Krest Bay on the Bering Sea. Since completion of the concentrator, the tin can be shipped more economically as concentrate over a 120-mile highway to Egvekinot, and from there directly to the Soviet Union's only tin smelter at Novosibirsk.

This article is abstracted from a survey by Theodore Shabad, a research consultant on the economic developments of the Soviet Union and Communist China, which appeared in "The American Metal Market", January 21, 1960

The Iultin mine is situated in the Chukchi National District, an administrative division occupying the north-eastern tip of Siberia, opposite Alaska. Other tin mines are believed to be operating at Krasnoarmeisky, near the Arctic Ocean, east of Chaun Bay, and at Bilibino, south-west of Chaun Bay.

Virtually all of the Soviet Union's tin reserves are found in Siberia. Before World War II the principal producing area was the Transbaikalian district, with mines at Kakhacheranga, Sherlovaya Gora and Olovyannaya. By 1940 Soviet tin output is believed to have been 3,000 tons.

## New Areas in Production

During the war new areas were put into production in the Yakut Republic, in the Magadan region, and in the Maritime region north-east of Vladivostok.

The tin centre of the Yakut Republic is Ege-Khaya, near the Yana River, east of Verkhoyansk. The Ege-Khaya mine, opened in 1940, sends its ore to the nearby Yana River port of Batagai, where the ore is concentrated before being shipped down the Yana River during the brief Arctic navigation season. The Batagai concentrator can also yield zinc-indium concentrate as a by-product.

Another Yakut tin producer, one of the northernmost mines in the Soviet Union, is at Deputatsky (69° 20' North 140° East). Deputatsky, site of a placer deposit opened in 1953, sends its ore by truck to the Yana River port of Ust-Kuiga.

In 1957, the Yakut Republic produced 21 per cent of the Soviet Union's tin, according to official Russian percentage statistics. If 1957 Soviet production is assumed to have been 20,000 to 25,000 tons, the share of the Yakut area was 4,000 to 5,000 tons in that year. According to a recent Soviet statement, Yakut tin output in 1959 was 19 per cent higher than in 1956.

In the Magadan region, tin production began during World War II along tributaries of the upper Kolyma River. The mining centres are Ust-Omchug and Butugychag, 120 miles northwest of Magadan. Another mine and concentrator at Galimy, 250 miles northeast of Magadan, opened in 1954.

One of the most important tin-producing areas is the Maritime region near Vladivostok. The oldest tin mines in the region were Sinancha and Lifudzin, which began production during World War II. In the post-war period tin mines and concentrators were opened near by at Kavalerovo (1950), Khrustalny (1954), Vysokogorsk (1956) and Krasnorechensky (1956).

In another part of the Maritime region, an open-cut tin mine and concentrator are operating since 1957 at Yaroslavsky, near the southern end of Lake Khanka.

Other Soviet tin deposits worth noting are the Khingansk deposit near the Amur River West of Khabarovsk and the Kalba deposits of Eastern Kazakhstan.

Nearly all Soviet tin reserves are in lode deposits with placer ore accounting for only 9 per cent of present reserves. Virtually all the Soviet lode production of tin is associated with sulphide ores.



# **A MINERAL RESOURCES POLICY FOR BRITAIN—III**

## **A BLUEPRINT FOR POLICY MAKING**

**T**HE discussion of the present set-up in Britain has concentrated mainly on the facilities for formulating a mineral-resources policy if such a policy existed—i.e. the facilities which would come within the “mineral statistics and information bureau”. However, as has been indicated, we also need a high-level group to provide guidance, and to make sure that the optimum use is made of the work of such a bureau. This advisory panel may be the main thing which is lacking.

Any government policy group probably should be within the area of the Minister for Science, where one finds the Department of Scientific and Industrial Research (within which fall the Geological Survey of Great Britain and the Warren Spring Laboratory), and a group of committees and advisory councils working out of the office of the Lord Privy Seal (formerly out of the office of the Lord President), who is also the Minister for Science.

### **Need for Co-ordination at Policy Level**

There is some question as to how well these groups operate in the general field of science. Observe the remark in *The New Scientist* on the Advisory Council on Scientific Policy that “one cannot pretend that the Council is an ideal method of linking science with democratic government, but in a scientifically illiterate country it is perhaps the best we can hope for at present”. However, there is no question about the way they operate in the field of mineral policy, as they appear to have no interest in the field, and no members who could encourage such interest. Such councils and committees claim a few afternoons a year from their members, who are no doubt able men, but who can hardly be expected to come up with anything very profound on this basis. Considering the relatively large number of people now paid by the Government, who would be affected by a mineral resources policy, and the relatively large amount of government money which must be spent directly and indirectly on various unco-ordinated groups working in the mineral field, it would seem worthwhile to have someone on a high level (preferably someone with a technical knowledge of the problems) charged with co-ordinating the work, and setting some overall objectives. Results would probably be most gratifying, not only in money saved, and in mistakes avoided, but also in the morale and sense of purpose of the groups working in the field.

It has been noted by many that Britain is not “mineral conscious” and that other countries — Australia, Canada, the U.S.\*—are. In Australia, the Bureau of Mineral Resources is active in the field of mineral statistics and mineral exploration, so that when one talks of the place of minerals in the economy there are men in the government who have a running assessment of the situation. Similarly with the Canadian Geological Survey and Mineral Resources Division; the U.S. Geological Survey and Bureau of Mines; the French Bureau de Recherches Géologiques et Minières and the Bureau de Documentation Minière. Similarly there are to a

**By JAMES F. McDIVITT**

greater or lesser degree government bureaux and research institutes in most industrial countries till we come to Britain.

Here the Geological Survey of Great Britain has as its recognised task the completion of the geological map of Great Britain, and has no section concerned with mineral resources as economic materials.† On the other hand the Overseas Geological Survey, which does have a Mineral Resources Division, is confined in theory at least to working in the dwindling colonies. These organisations work in the way that they are supposed to work, and according to their terms of reference. Within their framework they are excellent bodies. However, they are not able to perform services for the government and the country which anyone acquainted with the workings of similar branches in other countries would expect them to do. In fact this area of information and evaluation is a blank.

The Overseas Geological Survey, which is best equipped to do the job, cannot work within the domain of the Geological Survey of Great Britain. The Geological Survey of Great Britain has very limited facilities and interest in this field. Not only is there a void but, so far as responsibility for this field of mineral intelligence is concerned, there may indeed be a vacuum, for such groups tend to stop a bit short of their boundaries rather than to overlap. Note that the vacuum may be one of responsibility, not of actual information. The Overseas Geological Survey, for example, has a good deal of information.

### **Where is the Initiative to Come From?**

This being the case, it is difficult for pressure for a policy to come from within the government, even though individuals and groups in the government see the need, and indeed express opinions, as in the 1955 Symposium. Since there is no public “mineral consciousness” there will be no public pressure.

The other main area of interest should be among mineral producers and consumers and businesses associated with the mineral industry. Most such businesses must have a natural interest in the objectives of mineral resources policy, as all would wish to add a degree of stability and balance to mineral production and distribution which is now often lacking. However, policy normally means government policy, and government policy unfortunately tends to end with some form of bureaucratic imposition — regulation, interference, masses of forms and statistics—so that many business men would think twice before actively encouraging anything which might lead to this, even if they did favour the pure objectives.

British mining companies don't have to give too much thought to mineral resources policy as Britain is not a significant mineral producing nation (always leaving out iron and coal), and companies based in Britain are mostly producing overseas for the world market rather than the British market. They would probably benefit from such a policy, but as they are often very large organisations, they may be satisfied with their own internal information and statistics services. The

\* Long extracts from an address on “The Role of the U.S. Bureau of Mines in 1979” appeared in *M.J.* Dec. 25, 1959, and Jan. 1, 1960. This is long-range planning with a vengeance!

† They have a radioactive division, but this is a special category.



local British producers, as represented by the United Kingdom Metal Mining Association, and the Cornish Mining Development Association of course, have a strong interest in policy, but their voice is weak and their interest sectional. The information which they have assembled to support their appeals is nevertheless extremely valuable when assessed by a body in a position to look at the overall picture.

The manufacturers of finished products do not have to worry too much about a mineral resources policy, as in the short-run they can pay any price for semi-processed mineral raw material so long as all of their product competitors have to pay the same price. Moreover, in the long run, they can substitute other minerals, or if necessary some non-mineral product. At this stage the producers should become more interested in policy!

There remain a number of other groups concerned with minerals which are often not considered, but which should have an interest in policy. They include the brokers, the banks, shipping companies, the mineral processing plants in Britain, the fabricators, and makers of basic shapes and forms, and many others devoted to equipping and servicing the mining industry.

Interest in mineral resources policy to date has been expressed by individuals in all these areas — government, producers, consumers, auxiliary industries, and in addition from the university and the mining press. Such interest was stimulated in Britain by the acute problems of mineral supply during the war and again during and after the Korean crisis. These may have been unavoidable, but they could have been much less extreme if we had been better prepared with background information and understanding. Now that things are back to normal—no extreme shortages, but certainly no balanced pattern—the interest in a mineral resources policy has perhaps died down again.

In the world of today this is not a condition which will continue. Ultimately there will be a policy, perhaps because the government notices that everyone else has one, and decides that we should have something too; perhaps because we have another crisis, and the government is forced to act once more in a hasty and expensive way. Thinking and planning in this field will come, and the fact that we are not a mineral producer should be hastening it rather than hindering it.

### Making Use of What We Have

Since all phases of the mineral industry do have an interest in such policy, and certainly will be affected by it when it is built up under them, perhaps it would be wise to see how the mechanics of policy making might be developed out of existing organisations.

The "mineral resources policy advisory board" would probably be a combination of men from business, universities and government. Its effectiveness depends not only on the ability and interest of its members, but also upon the support it gets from the "mineral statistics and information bureau". Thus the two bodies rely upon one another. The board to be properly effective must include men with intimate, and in some cases at least technical, knowledge of the mineral industry and its problems. The type of council and advisory board so common in Britain cannot be claimed to be very effective and can in some situations have a negative effect through giving the public and the elected government the impression that certain areas are being adequately considered. The "mineral resources policy advisory board" must be capable of advising on mineral resources policy, and to find in Britain a balanced group to make up such a board would not be simple.

The equivalent of the proposed bureau in most countries is a part of a government agency and the same pattern could be followed here, as there is a nucleus in the government which, with some not too great change in emphasis, could serve this

This is the concluding article of a short series by Professor James F. McDivitt. In the first of these he discussed the need for a British mineral resources policy and in the second he sought to identify the government departments and other agencies which at present maintain intelligence services relating to various aspects of the problem. In this final article he suggests how existing facilities might be better co-ordinated as a basis for policy making. Both *The Mining Journal* and the author are indebted to the British Mining Equipment Export Association for permission to incorporate in these articles material from Mr. McDivitt's recent report to the Association on the same subject

purpose. However, in Britain, we should also consider the possibility of an industry-supported statistical and information bureau modelled after the British Iron and Steel Federation, which serves the functions that we are considering for the iron and steel industry.

At this point it is necessary to note that the remarkable inconsistency of the British Government in its handling of different areas of the mineral world is most confusing to an outsider, for we go from complete national control of the coal industry, to a sort of joint policy body made up at the Government's Iron and Steel Board on one side and the industry's British Iron and Steel Federation on the other, for iron and steel, to complete lack of anything in the non-ferrous metals—a rather interesting range of relationships for a government to try to justify. This, of course, is why it has been necessary to point out that when we talk of mineral resources policy we mean policy for the non-ferrous metals.

### The Basis for a Statistics and Information Bureau

A government bureau for mineral statistics and information would grow most naturally from the Mineral Resources Division of the Overseas Geological Survey. At present this body is financed by funds from the Colonial Development and Welfare Fund of the Colonial Office, and is concerned with the development of mineral resources in the colonies. However, it has never given up the statistical work that it did under the old Imperial Institute. The men in the Division must have gone to considerable effort to maintain this study, with the result that the organisation, the library, the contacts, and the approach, still exist. Moreover, now that the Overseas Geological Survey has recently moved to new and more spacious quarters, they exist in a physical environment which would allow them to expand and to take on more responsibility in this field.

One wonders, however, about the mental environment of men working within a department agency whose area of responsibility is continually dwindling, and whose objective is ultimately to do away with itself. This can hardly be very stimulating, conducive to good work, or attractive to potential recruits. One wonders even more though about the eventual destiny of the Overseas Geological Survey which, in its present form has no future, but which has done and is doing its job rather well, has an active and progressive technical administration, and has these modern and extensive facilities for considering a wide range of mineral problems on the economic level.

### The French Example

Here it is of some interest to study the situation in France, where many of the same problems existed and where they have been met by a total reorganisation (not yet completely worked out) of the government agencies in the field of mining and geology. Under the new regulations, the mineral bureau for

France and the several bureaux for the colonies have been combined into one central bureau for geology and mining, which will continue to undertake the mapping and exploration programme in France (rather more extensive and economically orientated than that of the Geological Survey of Great Britain), will continue the work in the colonies, will be able to continue to assist the colonies after they become independent (denied to our Overseas Geological Survey), and may also act as the agency through which foreign aid to other countries in the field of mining and geology passes (as is done in the United States agencies).

When similar changes are suggested in Britain, as when it was proposed that the Colonial Development Corporation or the Colonial Development and Welfare Fund be allowed to work in new Commonwealth countries, there are strong objections. Such a change as France has made has caused and is still causing, much administrative difficulty, but the need for the change was seen and acted upon. Similarly, to take the Overseas Geological Survey with its Mineral Resources Division from the Colonial Office, and put it in the D.S.I.R. along with the Geological Survey of Great Britain and the Warren Spring Laboratory, and change its terms of reference to give it broader scope might cause some administrative difficulty, but the basic purpose of government is not to make life simple for administrative staff. It would not only give us the basis for a mineral statistics and information section but would co-ordinate the several government groups working in the mineral field. There would be loose ends such as The British Commonwealth Geological Liaison Office, and the work on mineral economics at D.S.I.R. headquarters, but these have been expedients which merely tried to fill a need when no other machinery existed. It might even be possible to bring the mineral work of the Commonwealth Economic Committee (a Commonwealth rather than a British government body) into close liaison so as to make this work more meaningful.

Properly co-ordinated, and given enlightened direction, this combination of existing scattered and in some cases frustrated and almost aimless groups, could give us what we need. The cost to the government would probably be less than at present, the results infinitely more, in money saved, in world status, in morale. It would seem a good bargain.

### The Alternative Approach

The alternative to a government minerals bureau would be one supported by industry. One could not do better than to pattern such a body directly on the British Iron and Steel Federation, which operates in all the areas we have been discussing, and provides a large number of additional services to the industry, the government and the public. Although there is a parallel government body in the Iron and Steel Board, the industry, by self-discipline and by anticipating needs and actions, has been able to work out the problems of the industry without the need of active government control. The Federation has what is probably the most comprehensive statistical and information service in British industry, undertakes co-ordination and planning on an industry-wide basis, takes steps to assure the long-range and short-range supply of raw materials when necessary, and provides the government with well-documented information, in this way acting as the spokesman of the industry.

Perhaps it is not so easy for non-ferrous metals interests to form such a federation due to the fact that some of the metals compete with one another, and because the problems are not all the same. It may be indeed that there has been an attempt to form such a federation, for the basic structure of the British Non-Ferrous Metals Federation, and the British Bureau of Non-Ferrous Metal Statistics, of which the Federation is the chief sponsor, does in some respects resemble that of the British Iron and Steel Federation. Whatever the original

hopes when these groups were set up in 1946, they now are mainly interested in copper and certainly are not concerned with the full range of the non-ferrous metals. The bureau as envisaged has to draw its support from across all the non-ferrous metals, and to be effective must be able to operate on a somewhat detached plane, without interference from individual sponsors.

In spite of such problems, it might be worth while to see if the present British Non-Ferrous Metals Federation and the Bureau of Non-Ferrous Metal Statistics could take on this broader function, given correspondingly broader support.

### The Crux is Interest at the Right Level

This casual shifting of private and government agencies from one slot to another might not prove to be as difficult as it may seem, since in all cases the shifts are to areas of greater scope and greater responsibility, and intelligent people are normally stimulated by the challenge of such changes.

These are two possibilities. The eventual solution may turn out to be something quite different, which doesn't matter so long as something happens. The problem is to generate adequate interest on the right level, and, as so often in Britain, it is difficult to know what the right level is. On the surface, government interest should come from D.S.I.R., from the office of the Minister for Science, from the Ministry of Defence, and from the Atomic Energy Commission. Warren Spring Laboratory proves that interest does exist, and support of Warren Spring could magnify that interest.

At this stage we must return to one of the original points—that there is no group in Britain, either in or outside of the government which is responsible for being informed on questions of mineral resources policy. So long as this is true, all our talk about mineral resources policy must continue to be just talk.

Before trying to stimulate high-level interest in the formation of such a group, it would seem wise to have a rather precise idea of what is meant by policy, its range, objectives, and limitations, and of the structure of the bodies necessary for the formulation of such policy. It is here that these articles may, perhaps, have been of some value.

## Yugoslavia's Mineral Industry in 1959

**D**ETAILED figures issued by the Yugoslav Government from Belgrade show that 610,000 tonnes of bauxite were exported last year, as against only 590,000 tonnes in 1958—an increase over the year of 3 per cent. The main customers were Federal Germany, Italy and the United Kingdom.

Some 72,000 kilogrammes of bismuth were exported by Yugoslavia last year to a number of countries led by Federal Germany and the United States. It is anticipated that exports for 1960 will be higher. Annual Yugoslav output of bismuth varies from 78,000 to 110,000 kilogrammes depending upon concentrations in raw materials.

Production figures for the whole of 1959, now obtainable in final form, show output for the year (1958 production totals in brackets) of 21,107,000 (18,986,000) tonnes of coal, 1,299,000 (1,119,000) tonnes of raw steel, 26,285 (17,092) tonnes of rolled and drawn aluminium and alloyed goods and 38,103 (35,008) tonnes of magnesite, chromite and chrome-magnesite refractory materials.

The Idrija quicksilver mine in the Yugoslav republic of Slovenia is at present undertaking a reconstruction programme for completion in September of this year.

## DEVELOPMENTS IN THE WORLD'S COAL MINING INDUSTRY

**A** QUICK, easy and inexpensive method of determining the consolidation of overburden in strip operations has been developed by Caterpillar Tractor Co., and reported in *Coal Age*. The new process, called seismic analysis, is based on the principle that sound or shock waves travel through different sub-surface materials at varying speeds and along different paths.

By this method the strip mine operator can determine rippability of the overburden and, hence, the most economical method of breaking and removing it.

The seismic method involves use of a refraction seismograph which measures the overall consolidation of subsurface materials, including such factors as rock hardness, stratification, fracturing and the degree of weathering. It also is possible to determine the thickness of various layers of subsurface materials to depths exceeding 100 ft.

The only equipment needed is an 8-lb. sledge hammer, a small steel plate, a coil of wire, a geophone receiver, the refraction seismograph and a set of tables. Two men, after a minimum of training, can perform a seismic study in hours.

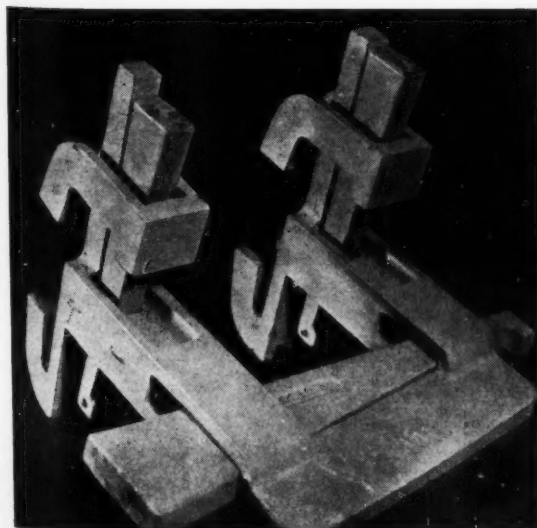
The refraction seismograph works on the principle that sound waves travel through subsurface material at different speeds and along different paths. The seismic wave is produced by a sledge hammer striking a steel plate at various distances from a geophone receiver. The receiver is sensitive only to the first seismic wave that reaches it. Thus either the seismic wave that travels the shortest path or one that travels over a longer path but which includes a high velocity segment triggers the geophone. The time interval between the hammer blow and receipt of the seismic wave at the geophone can be read directly on the instrument panel.

These velocities can be used to determine rippability of the subsurface materials and the depth of each layer.

### A Horsehead Supporting Bracket

In Britain, a horsehead supporting bracket to provide a rigid connection for two joists or similar members crossing each other has been designed at the N.C.B.'s Central Engineering Establishment. The object in designing the bracket

The Brethby Horsehead Bracket



The Parker Mobile Screening Plant

was to lock forepole girders to mine roadway arches, but the design will obviously have much wider applications. The bracket has a "U" shaped main body inside which the forepole girder is supported. The ends of the vertical arms of the "U" are shaped to form hooks which are locked on to the bottom flange of the roadway arch.

Of the two pairs of hooks which lock on to the arch flange, one of each pair is integral with one arm of the "U" and one is independent of the arm but is so slotted that it will ride upon a rectangular guide arm: these guide arms are integral with the "U" arms and on the opposite side of the arms to the fixed hooks. Each pair of hooks on the "U" arms is provided with a small wedge which, when driven in, securely locks the bracket to the upper member. When the wedge is loose the independent hook is free to slide along the guide arm, but the arm is provided with a stop to prevent the hook becoming detached from the bracket. The wedges are also provided with stop pins after assembly to ensure retention in their respective slots.

The sides of the "U" shaped body are slotted to allow a long wedge to pass through both sides. The cross bar of the "U" body has a sloping top edge to contact with the tapered lower edge of the wedge. The untapered top edge of the wedge is thus parallel with the bottom flange of the forepole girder and, when the wedge is driven in, it forces the forepole girder against the arch and locks them together by friction. This long wedge is also fitted with a stop pin to retain it in position in the bracket. The width and depth of the "U" shaped body can be arranged to fit any size of cross member, and the long wedge can be thinner or thicker to give a range of adjustment. The sliding hooks will accommodate the whole range of standard arch sections normally used underground.

### Mobile Screening Plant.

A mobile screening plant, made by Frederick Parker Ltd., and built specially for the N.C.B., is being used at an East Midlands colliery to re-screen good quality Hazel doubles coal from stockpiles. The plant, which is mounted on pneumatic, rubber-tyred wheels, consists of a 4cu.yd. capacity hopper, mounted above a 48 in. x 96 in. single deck "Rapide" two bearing, free floating type vibratory screen, and two conveyors for loading direct into lorries or stockpiling.

The Coal Board are at present re-screening the Hazel doubles to remove minus  $\frac{7}{8}$ -in. slack. It is possible to screen out and load 25 tons of Hazel doubles into lorries in 50 minutes. Drive is by a 10 h.p. Petter A.V.2 diesel engine.



## MINING MISCELLANY

The Indian Minister for Heavy Industry and Mining, Mr. Swaran Singh, announced in Delhi recently that by the end of the country's third five-year plan some 95,000,000 tonnes of coal and 10,000,000 tonnes of steel will be produced annually. The three state-owned steelworks at Rourkela, Bhilai and Durgapur are to be expanded and a new steelworks has been planned for erection at Bokaro, in Bihar. The Minister stated, however, that the steel target for the end of the second five-year plan, 6,000,000 tonnes, might not be met owing to the running-in of new plants.

The Syrian Government plans to invest some £5,600,000,000 in industry and mining, of a total of £5,273,000,000 budgeted for the coming five-year development plan. About £5,20,000,000 is to be allocated for eighteen specific mining projects, including a complete geological and topographical exploration programme for the country, and intensified search for iron, copper, chrome, magnesium and phosphates. A further £5,227,000,000 will be invested in the metal, machinery, electric power and other industries.

East Germany is sending delegates to India to discuss their country's role of East Germany in India's industrialization with private and state undertakings. Main project to be discussed is the building of a brown-coal powered installation for the smelting of low-grade ores.

Exports of slate by the Norwegian company A/L Alta Skiferbrudd are reported to be increasing to both Europe and the British Commonwealth. World marketing is conducted through the Swiss firm of Quarzite A.G.

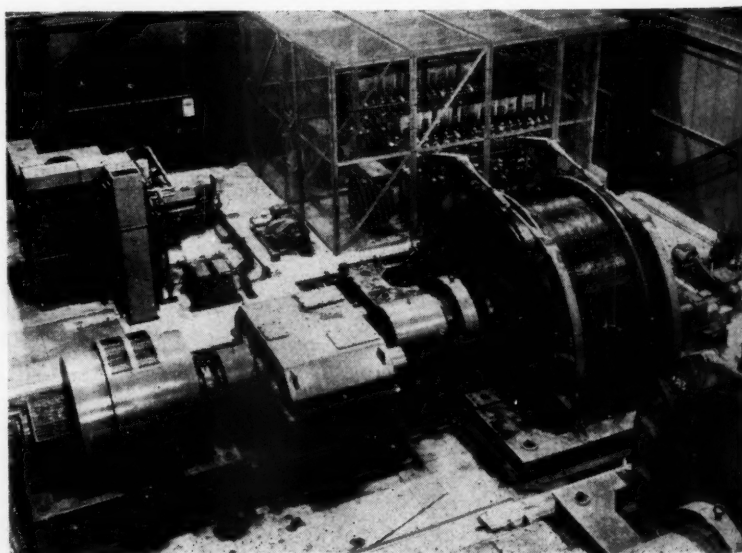
The Norwegian lead and zinc producer, Norske Sing og Blygruber A/S has announced that working is shortly to commence of the Mofjellet ore reserves, with an initial annual tonnage of 70,000, to be increased to 92,000 tonnes by 1962. The company also reports that some 107,000 tonnes of ore will be produced from the Bleivassli mines in 1960, and that the whole year's output of zinc, lead and copper concentrate has already been sold. Sales of sulphur pyrites are, however, not yet satisfactory, and studies are to be made into the possibility of local processing.

It is reported from Togo, which has just become an independent state, that phosphate deposits in the Akoumapé area on Lake Togo are to be mined later this year. Some 750,000 tonnes of concentrates are to be produced annually by the Compagnie Togolaise des Mines de Benin, a joint undertaking of the Togolese Government and the private companies Phosphates de Constantine, Cofimer, Pennaroya, Schiaffino and Pierrefitte. Togo has further small traces of iron ore in the north, small bauxite deposits have been reported in the Agou mountains and reserves of titanium near Sokodé, but none of these seem likely to be economically exploitable.

The West German experts called in to study and report on the iron ore deposits in the Sierra Grande area of the Argentine have completed their preliminary investigations. In an initial report they state they believe the deposits to have "great economic importance". The deposits, consisting of 24,000,000 proven tonnes of ore with 55 per cent iron and 1.3 per cent phosphorous content are complemented by a further 57,000,000 tonnes for the study of which borings will have to be made to depths of 600-800 metres. It is anticipated that Germany will provide, at least on loan, the equipment for this boring operation. Some 6,000,000 to 7,000,000 tonnes of the deposit could be mined by opencast methods for transportation to the port of Puerto Madryn, 88 miles distant. The high phosphorous content of the ore would mean that processing at the San Nicolas steelworks would entail an extra converter stage, though the extra process would mean that synthetic fertilizers could become a valuable by-product. The Argentine Government is believed to view the exploitation of the Sierra Grande ore as highly important.

Jordan has requested help from West Germany for projects including geological exploration, and it has been announced from Bonn that West Germany is prepared to sign a technical aid agreement, following recent talks between the two countries' Ministers of Trade.

Four dual-purpose tower-mounted mine winders have been supplied by the Heavy Plant Division of Associated Electrical Industries Ltd. for the N.C.B.'s Kellingley Colliery in Yorkshire. Two of these, each driven through a co-axial reduction gear box by a 1,100-h.p. a.c. motor, are in use in No. 1 tower at the colliery. No. 1 Shaft at Kellingley will eventually be 2,400 ft. deep. Two other winders, twice as powerful, have been installed in No. 2 Tower. All will be used both for shaft-sinking and for raising coal. On all four winders the AEL system of dynamic braking is used. M. B. Wild and Co. Ltd., supplied the mechanical parts of the winders. Illustration shows one of the winders in No. 1 Tower at Kellingley

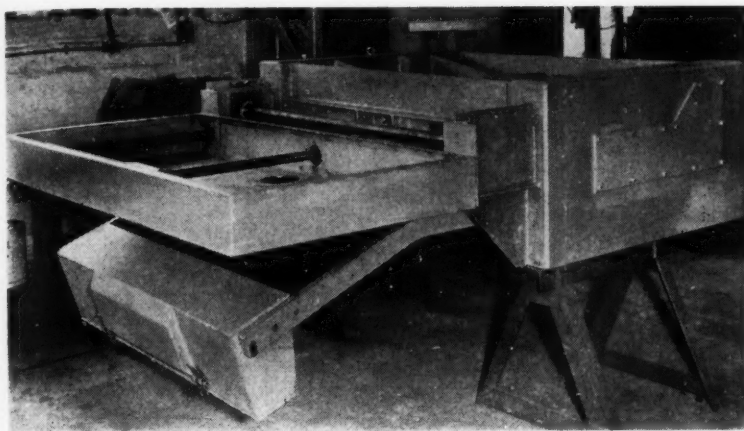


An Austrian delegation, led by the country's vice-chancellor, Bruno Pitterman, has paid a visit to Chile to discuss the possibility of Austria's purchasing Chilean copper.

As the result of recently-signed trade agreements, Hungary is to buy quantities of iron ore and industrial diamonds from Guinea, tin and apatite from North Vietnam, phosphates from Tunisia and mineral raw materials and non-ferrous metals from China.

Although the permissible export amount for tin from the Federation of Malaya was increased from 11,325 tons in the last quarter of 1959, to 13,590 tons in the first quarter of 1960, the country's output was only 11,044 and 12,256 tons of tin-in-concentrates for these respective periods, while deliveries of tin concentrates to the smelters were 11,421 and 13,250 tons. At the end of March there were 52 dredges, 425 gravel pump mines and 44 other tin mines, a total of 521 mines, in operation, compared with 45 dredges, 392 gravel pump mines and 46 others, a total of 483 at the beginning of the year. The labour employed increased from 23,778 persons to 25,514. Malaya's permissible export amount for the April-June period is 14,156.25 tons, so that an increase is to be expected in the number of mines to be re-opened and the number of persons employed.





Three sets of equipment for the automatic sampling of iron ore at an Italian steel works have recently been despatched from Britain by Birtley Engineering Ltd.. Each set is to be located on the head end of a conveyor in the ore blending plant and is designed to carry out primary and secondary sampling and conveying of reject back to the main stream automatically, producing a final representative sample of easily handled proportions. The conveyor feeds to be sampled have capacities of 400 t.p.h. (two) and 200 t.p.h. (one). It is believed that this will be the most up-to-date iron ore sampling installation in Europe. The illustration shows a typical Birtley medium duty swing arm type primary sampler

Four countries wish to purchase Chilean copper from the quantities set aside by the large—American-owned—producers for local use or export, according to an official report handed to President Alessandri by Sr. Domingo Arteaga, president of the Confederation of Industry. Sr. Arteaga led a Chilean trade delegation which recently visited the Soviet Union, Poland, Czechoslovakia and Hungary, and his report contains a survey of conditions necessary to establish and develop trade with those countries. According to the report, the Soviet Union at first showed interest in wire bars but not in semi-fabricated copper. Later, however, the U.S.S.R. proposed acquiring the total present refined output of Empresa Nacional de Fundiciones plus a portion of its semi-fabricated copper. Poland wished to buy 20,000 tons of copper wire and 15,000 tons of copper concentrates to be refined in Poland during the present year. Czechoslovakia was interested in electrolytic and/or blister copper and even high-grade copper ore concentrates, although no quantities had been mentioned. Czechoslovakia offered mining equipment, hydro-electric plants, as well as a capacity to refine about 30,000 tons of copper yearly. Hungary was interested in acquiring about 1,000 tons of fire-refined copper and about 10,000 or 15,000 tons of wire bars, all payable in hard currency.

Kulim Rubber Plantations have announced the location of an iron ore deposit, claimed to be valuable, on their Sungai Toh Pawang Estate, at Bedong, in Kedah, Malaya. A leading firm of mining engineers is advising on exploitation, and an option has been granted to a Chinese mining firm, with a right to prospect an area of about 500 acres, but some months will elapse before boring results are available and a government mining lease can be obtained.

Mr. R. De Grio, manager of the El Dorado gold mine has announced a large gold strike near Allegheny, about 250 miles north-east of San Francisco. Confirmation is awaited of the value of the strike, which had been reported to be an enriched quartz deposit, 5 ft. thick, 30 ft. wide, and estimated 600 ft. long, running 50 to 75 per cent gold.

★

A contract has been signed between the New Zealand Government and the Japanese concern, Banno New Zealand, for the sale to Japan of 50,000 tons of coking coal at 87s. per ton. It is understood that the agreement includes a provision allowing Japan to export to New Zealand approved goods to the value of £1 for every £2 involved in the coal deal.

★

The U.S. Development Loan Fund recently announced approval of a \$30,000,000 loan, details of which are still to be negotiated, to India to help finance a 250,000 kWh. thermal power plant in the Damodar Valley. An official announcement said that the U.S. were also lending India \$43,000,000 in rupees to meet local costs of building the plant, the rupees being derived from the sale of surplus American agricultural commodities to India.

★

The Nippon Mining Co., has concluded a contract with Broken Hill Proprietary for the import of 700 tons of copper speiss from Australia, shipment to be completed early in June. This is the third import of copper speiss, which is lower in price than concentrates, and the imports are to be used for testing purposes, because of their high lead and arsenic content. If satisfactory, further imports would be made for smelting, to meet Japan's growing demand for imported copper concentrates and ore.

Texas Gulf Sulphur Co. will acquire and commercially develop Delhi-Taylor Oil Corporation's Utah potash properties, Delhi-Taylor retaining a 25 per cent net profits interest in the profits, and a guaranteed advance net profit payment of \$4,500,000 over a four and one-half year period. A first payment of \$500,000 has already been received. Production is expected in 1961 when examinations have been completed. Reserves in the two areas concerned in south-eastern Utah are said to be considerable.

## A.E.A. AT THE FUEL EFFICIENCY EXHIBITION

The U.K. Atomic Energy Authority took part in the Fuel Efficiency and Power for Industry Exhibition at Olympia, London, from April 27 to May 6. The major theme of the A.E.A.'s stand was the immense effort employed to provide an efficient nuclear fuel supply service on a scale big enough to keep pace with the British atomic power and research programmes and to meet commitments to Britain's reactor customers overseas.

Stages in the manufacture of the elements from crude uranium ore to the finished product were described and illustrated. This work is done at the Authority's Springfields Works which have so far produced more than 1,000,000 of these elements, and a special feature of this section of the display was an animated diagram which explained the complex ore-to-metal process stream at Springfields.

A second important feature was provided by the Authority's research programme to reduce future power generating costs. It described the new departures in reactor design embodied in the Advanced Gas-cooled Reactor, the Fast Breeder Reactor and the High Temperature Gas-cooled Reactor.

A novelty of the exhibition was a working model not previously shown in London, built by the Authority to demonstrate the operation of a nuclear reactor. It consisted of a large "cut-away" model of Calder Hall and its associated turbines, equipped with a panel from which the reactor controls can be operated.

## PRESIDENT-ELECT OF THE I.M.E.

Mr. Robert A. Moore, O.B.E., J.P., B.Sc.(Min.), has been elected President of the Institution of Mining Engineers for the year 1961-62, and will succeed Mr. R. G. Baker, C.B.E., B.Eng.(Min.), at the 67th Annual General Meeting of the Institution to be held in London on January 26, 1961. Mr. Moore was born in 1907 and is the grandson of the late Ralph Moore who was the first Inspector of Mines in Scotland. His uncle, the late Dr. Robert Thomas Moore was President of the Institution in 1908-1909. Mr. Moore joined the Institution in 1933 and has been a member of Council since 1941. He was President of The Mining Institute of Scotland in 1955 and 1956 and is a member of The American Institute of Mining and Metallurgical Engineers. He was awarded the O.B.E. in 1946 and was appointed a Justice of the Peace, County of Dunbartonshire, in 1954.

## Technical Briefs

# A Stable Platinum Plating Solution

The development of platinum plating has been limited due to the difficulties associated with conventional plating baths. Johnson Matthey have now made available a stable platinum plating solution from which bright, heavy and coherent deposits may be obtained. This bath, known as DNS platinum plating solution, is based on the complex sulphato - dinitrito - platinumous acid,  $H_2Pt(NO_2)_2SO_4$ , and patent applications covering electrolytes of this type have been filed in a number of countries.

The bath is acidic, and may therefore be used successfully on electrical components and on printed circuits. Platinum from DNS solution can be deposited directly on to copper, brass, silver, nickel, aluminium and titanium. For deposition on tin, zinc, cadmium or steel an undercoat of silver or nickel is necessary. The exceptional resistance to corrosion characteristic of platinum, coupled with its ease of deposition, assure the electro-depositor of a wide variety of industrial uses.

Deposits from the new bath are exceptionally bright and lustrous at all thicknesses, and no polishing is required. Electrographic tests have shown no evidence of porosity in deposits up to 0.001 in. in thickness on polished copper. Above this thickness some slight evidence of cracking may be observed. Microhardness tests on deposits give value of 400 to 450 VPN.

The DNS platinum plating solution is supplied as a concentrate containing 10 g. platinum per 100 ml. of solution. For general use this should be diluted to 5 g. platinum per litre. Glass, earthenware or plastic tanks should be used. The character of the deposits remains unchanged in the temperature range 30 to 70 deg. C., but the recommended operating temperature is 50 deg. C. At a current density of 5 amp./sq. ft., at 50 deg. C., the deposition rate is 0.0001 in. in two hours. At this rate very accurate control can be exercised over the amount of metal deposited, and for the majority of applications these conditions represent the best compromise of efficiency with economy.

A faster rate of deposition can readily be achieved by using a solution containing 15 g. platinum per litre at 20 amp./sq. ft., again at 50 deg. C. In these con-

ditions a thickness of 0.0001 in. will be deposited in 30 minutes. No agitation is required in using the bath. Where necessary, plating can be confined to specified areas by masking with a chlorinated rubber paint. Insoluble anodes are used in the process, and these should be of platinum. The anode surface area is not critical.

This new platinum bath gives bright, smooth deposits over a wide range of operating conditions. Deposits may readily be obtained up to 0.001 in. in thickness, and the bath gives consistent and reliable performance. The range of conditions within which satisfactory plates can be obtained makes the bath easy to work, and it does not deteriorate on standing.

## RAPID FIELD TEST FOR BERYLLIUM

An easy-to-perform, five-minute field test has been developed by U.S. Bureau of Mines scientists for detecting beryllium in efforts to spur a hunt for the metal. The testing procedure, which can be used by any prospector, reveals minute amounts of beryllium — even as little as thirteen-thousandths of one per cent. Chemicals and equipment needed for the examination are inexpensive and are readily available from commercial suppliers. No knowledge of analytical chemistry is required.

Because it possesses both lightness and strength, beryllium metal offers many potential advantages to designers of high-speed aircraft, missiles, and space satellites. The needs of researchers in these fields, new applications for beryllium in construction of certain types of nuclear reactors, and growing use of the metal in producing superior alloys, have caused demand to rise sharply in recent years.

The field-testing procedure was devised at the Bureau's Rolla Metallurgy

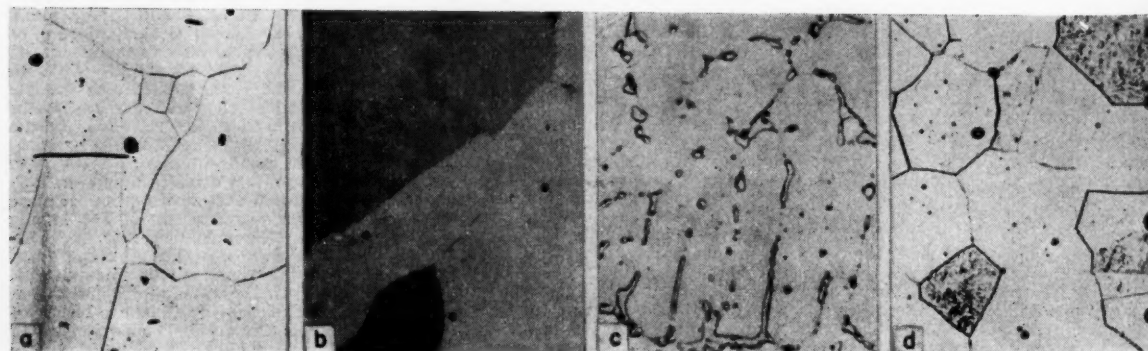
Research Centre and is an adaptation of laboratory methods developed originally by Bureau researches of College Park. It is described fully in a new publication just released. Copies of this report can be obtained from the Superintendent of Documents, U.S. Government Printing Office, at 15 c. each. It is not for sale by the Bureau of Mines. The publication is known as *Information Circular 7946, "Field Test for Beryllium"*.

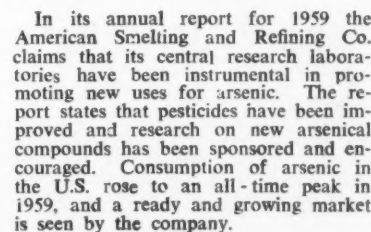
## ALLOYING BEHAVIOUR OF URANIUM

The U.S. National Bureau of Standards has recently completed a fundamental study for the Atomic Energy Commission for the sole purpose of gaining and providing information on the alloying behaviour of uranium. In order to construct a phase diagram of the two metals, J. J. Park, and D. P. Finkle of the Bureau's chemical metallurgy laboratory correlated data from thermal and metallographic analyses, and X-ray diffraction studies. The diagram on the next page shows that the system is characterized by 4 intermetallic compounds:  $U_{17}Pt$ ,  $U_{11}Pt$ ,  $U_5Pt$ , and  $U_2Pt$ . Each compound has a different hardness and melting point. These findings, while important to the development of atomic power, may have other applications, since some of the intermetallic compounds decompose at relatively high temperatures.

To understand and predict the properties of alloys, phase diagrams showing melting ranges, structural changes occurring at different temperatures, and solubility-temperature relationships are widely used. These diagrams also assist in studying the complex reactions that result from adding other elements to an alloy. The present study is the first work in an extensive programme to establish the binary phase relationships between uranium and the six platinum metals.

Typical structures of uranium-platinum alloys found by microscopic analysis at the U.S. National Bureau of Standards. Specimens a and d were etched in sodium cyanide, b and c were not etched. a— $U_{17}Pt$  phase, 66.7 a/o platinum (x100); b— $U_{17}Pt$  phase, 74.6 a/o platinum (x500); c— $U_{17}Pt$  phase in the matrix of  $U_{17}Pt$ , 82.8 a/o platinum (x500); d—alloy of 96.4 a/o platinum, terminal solid solution (x250)







## The I.C.I. - Alcoa Partnership Expands

An offer made by the Imperial Chemical Industries for itself and also on behalf of its partner in the aluminium industry, Alcoa, for the issued share capital of Almin Ltd., has been accepted by more than 90 per cent of the shareholders and is now unconditional. This represents the first major expansion of the I.C.I.-Alcoa partnership. Almin Ltd., with assets totalling about £5,000,000, is the parent company of the Associated Light Metal Industries group, embracing a wide range of light metals technology, with particular emphasis on aluminium, including secondary metal and finished products. The group comprises: International Alloys, Southern Forge, Warwick Production Co., Pressoturn, and Aero Controls. Also in the group is the Fulmer Research Institute, which is an independent establishment for carrying out sponsored research.

In September last year, I.C.I. and Alcoa collaborated in the formation of Imperial Aluminium Co., of whose capital I.C.I. holds 51 per cent and Alcoa 49 per cent. The immediate objectives of the new company were to take over I.C.I.'s aluminium plant in South Wales and to increase I.C.I.'s share of the domestic wrought iron market. The company's interests have already been extended, however, by the acquisition of

Invicta Foil Co. and the rigid aluminium division of the Prestige Group.

The latest acquisition is further and still more impressive evidence, if such were needed, of the determination of the I.C.I.-Alcoa combine to secure its full share of the expanding but highly competitive aluminium market in the U.K., in which Reynolds Metals, through its association with Tube Investments in the acquisition of British Aluminium, and Kaiser by linking with Delta Metal in the formation of James Booth, have also become very firmly entrenched. Aluminium Ltd., the leading company in the U.K. aluminium industry, puts its own British interests into a new company Alcan (U.K.) Ltd. in December last year.

What is claimed to be the largest self-contained aluminium extrusion press ever built is to be installed by the Reynolds Metals Co. in its Grand Rapids, Michigan, plant. Installation of this 4,000-ton press is to begin about May 30 and the unit is expected to be in production by midsummer. It will be used primarily to produce larger tubular aluminium extrusions for customers in the Eastern part of the U.S.

Eventual offers by foreign firms for the establishment of an aluminium industry in Greece are to be considered by the Greek Government with a view to finding the most advantageous solution as regards the country's interests, states a recent report. There have lately been indications of a possible renewal of American interest, such as the recent contacts which the president of Reynolds Metals had in Athens. Meanwhile, the French firm of Pechiney, whose representative also visited Greece, is understood to be willing to undertake the business and provide part of the necessary capital without insisting on a majority share in the enterprise. German concerns, such as the Kommerz-Bank, have also been reported as showing an interest in the project.

These solutions are all based on the investments of foreign capital and on linking of the aluminium industry with one of the big international consortiums, in order to secure the sale of the product in the world market. Otherwise, the prospective Greek aluminium industry, with a capacity of 4,000-50,000 tonnes of aluminium per annum, might be left with the bulk of its output on its hands, bearing in mind that local consumption is still only 4,000-5,000 tonnes annually. Other solutions under consideration include the setting up of the undertaking by the Greek state or a corporation, on condition that certain long-term understandings and link-ups to provide assured markets could be reached.

### MAGNESIUM PRODUCTION RISES

Commercial production of primary magnesium during the first quarter of 1960 was 10,055 tons, according to the Bureau of Mines, U.S. Department of the Interior. This was a rise of 8 per cent above production in the fourth quarter of 1959, and 82 per cent above the first quarter of 1959.

Production of magnesium is being stepped up in Canada as a result of increased domestic and foreign demand, as well as the near-depletion of plant inventories following a low rate of production last year.

Dominion Magnesium, currently Canada's sole producer of primary magnesium, planned to put its ten remaining idle retorts back on stream by the end of March. This company's capacity is rated at 8,000 tons annually. Canadian production declined from 9,600 tons in 1956 to 8,400 tons in 1957, 5,800 tons in 1958, and little more than 5,000 tons last year. Shipments and consumption last year, however, are estimated to have been in the region of 7,000 tons; hence a very substantial reduction in plant inventories has been effected.

For several months demand has been improving, both at home and abroad. Some domestic users, including Alcan, are reported to be taking twice as much as in 1959, shipments to the U.K. have risen by about a third, while substantial amounts are going to Volkswagen and other German manufacturers.

While prospects for the first half of 1959 are regarded as good, the longer-term outlook is less clear, due to Norway's expansion programme, now largely approaching completion, which could have an impact on Canadian sales abroad.

Japanese light metal producers stepped up magnesium production by a

## LONDON METAL AND ORE PRICES, MAY 5, 1960

### METAL PRICES

Aluminium, 99.5%, £186 per ton	Manganese Metal (96%/98%) £275/£285
Antimony—	Magnesium, 2s. 2d./2s. 3d. lb.
English (99%) delivered, 10 cwt. and over £190 per ton	Nickel, 99.5% (home trade) £600 per ton
Arsenic, £400 per ton	Osmium, £22/£24 oz. nom.
Bismuth (min. 1 ton lots) 16s. lb. nom.	Osmiridium, nom.
Cadmium 10s. 6d. lb.	Palladium, imported, £8 12s. 6d.
Cerium (99%) net, £16 0s. lb. delivered U.K.	Platinum U.K. and Empire Refined £30 5s.
Chromium, Cr. 99% 6s. 11d./7s. 4d. lb.	Imported £28/£28 1/2
Cobalt, 12s. lb.	Quicksilver, £702/£71 ex-warehouse
Germanium, 99.99%, Ge. kilo lots 2s. 5d. per gram	Rhodium, £45/£48 oz.
Gold, 250s. 0/2d.	Ruthenium, £16/£18 oz. nom.
Iridium, £23/£25 oz. nom.	Selenium, 50s. 0d. per lb.
Lanthanum (98%/99%) 15s. per gram.	Silver, 79 1/2 d. f. oz. spot and 78 1/2 d. f. d.
	Tellurium, 21s. 6d. lb.

### ORES AND OXIDES

Antimony Ore (60%) basis .. .. .	19s. 6d./21s. 6d. per unit c.i.f.
Beryl (min. 10 per cent BeO) .. .. .	230s./235s. per l. ton unit BeO
Bismuth .. .. .	30% 5s. 0d. lb. c.i.f.
Chrome Ore—	20% 3s. 3d. lb. c.i.f.
Rhodesian Metallurgical (semifabril 48%) (Ratio 3:1) .. .. .	£15 5s. 0d. per ton c.i.f.
Hard Lump 45% .. .. . (Ratio 3:1) .. .. .	£15 10s. 0d. per ton c.i.f.
Refractory 40% .. .. .	£11 0s. 0d. per ton c.i.f.
Smalls 44% .. .. . (Ratio 3:1) .. .. .	£13 5s. 0d. per ton c.i.f.
Baluchistan 48% .. .. . (Ratio 3:1) .. .. .	£11 15s. 0d. per ton f.o.b.
Columbite, Nigerian quality, basis 70% combined pentoxides (Ratio 10:1) .. .. .	Nb <sub>2</sub> O <sub>5</sub> : Ta <sub>2</sub> O <sub>5</sub> 175s./180s. per l. ton unit c.i.f.
Fluorspar—	
Acid Grade, Flotated Material .. .. .	£22 13s. 3d. per ton ex. works
Metallurgical (75/80% CaF <sub>2</sub> ) .. .. .	156s. 0d. ex. works
Lithium Ore—	
Petalite min. 3 1/2% Li <sub>2</sub> O .. .. .	47s. 6d./52s. 6d. per unit f.o.b. Beira
Lepidolite min. 3 1/2% Li <sub>2</sub> O .. .. .	47s. 6d./52s. 6d. per unit f.o.b. Beira
Amblygonite basis 7% Li <sub>2</sub> O .. .. .	75s/85s. per ton f.o.b. Beira
Magnesite, ground calcined .. .. .	£28 0s./£30 0s. d/d
Magnesite Raw (ground) .. .. .	£21 0s./£23 0s. d/d
Manganese Ore Indian—	
Europe (46%-48%) basis 67s. 6d. freight .. .. .	73d./75d. c.i.f. nom.
Manganese Ore (43%-45%) .. .. .	69d./71d. c.i.f. nom.
Manganese Ore (38%-40%) .. .. .	nom.
Molybdenite (85%) basis .. .. .	8s. 11d. per lb. (f.o.b.)
Titanium Ore—	
Rutile 95/97% TiO <sub>2</sub> (prompt delivery) .. .. .	£28 0s. 0d. per ton c.i.f. Aust'n.
Ilmenite 50/52% TiO <sub>2</sub> .. .. .	£11 10s. per ton c.i.f. Malayan
Wolfram and Scheelite (65%) .. .. .	142s. 6d./150s. per unit c.i.f.
Vanadium—	
Fused oxide 95% V <sub>2</sub> O <sub>5</sub> .. .. .	8s./8s. 11d. per lb. V <sub>2</sub> O <sub>5</sub> c.i.f.
Zircon Sand (Australian) 65-66% ZrO <sub>2</sub> .. .. .	£16/£16 10s. ton c.i.f.



third last year, thus attaining a new record in post-war output and also coming within 10 per cent of the peak wartime level in 1944. Primary magnesium production in 1959 totalled 1,720 s.tons which compares with about 1,100 s.tons in the previous year. Virtually all production goes for domestic consumption.

#### TUNGSTEN IN 1959

Preliminary figures released by the Bureau of Mines, U.S. Department of the Interior, indicate that in 1959, U.S. consumption of tungsten concentrate rose to 4,919 s.tons (contained tungsten) from 2,660 s.tons in 1958, and was the highest since 1951. The last stockpile purchase contract was terminated in 1959 and imports for consumption decreased 17 per cent compared with imports in 1958 (2,717 s.tons against 3,271). Domestic production of tungsten concentrate came from only two producers and totalled 3,403 s.tons (1,701 in 1958).

Net production and shipments of tungsten products increased by 100 and 65 per cent respectively, in 1959, compared with 1958. Consumption of tung-

sten products for the first eight months of 1959 increased by 95 per cent over the corresponding period of 1958. Stocks at producers' plants rose by 1 per cent during the year.

The wolfram ore shipment price in London is now indicated at 142s. 6d.-150s. per 1 ton unit c.i.f. Europe compared with 145s.-150s. previously. Contributing to the greater variation in prices recently noted has been reported further business in Russian material on the spot in the U.K. at 140 s. It is understood that some 40 tons were involved. Dealers have been reluctant to reflect this business fully when assessing the new price range, since much higher prices nearer the top of the range have been realized in other directions.

#### QUICKSILVER'S FIRMER TONE

The more reassuring tone recently evident in the London ex-warehouse quicksilver market is persisting and the price is currently quoted at £70 15s.-£71 per flask, compared with £70 10s.-£71 for the past two months.

Following this meeting a communiqué has been issued stating that total permissible exports for the six producing members of the agreement for the third quarter of this year have been fixed at 37,500 tons, which is unchanged from the previous control period.

The Council approved the following revised percentages for the following countries for the year beginning July 1, 1960:

Producers	1960-61	1959-60
	%	%
Belgian Congo	9.17	9.05
Bolivia	18.43	19.40
Indonesia	19.00	18.90
Malaya	38.20	37.75
Nigeria	6.20	6.10
Thailand	9.00	8.80

The main item of interest, however, is the fact that the authority has not been renewed by the Council whereby the buffer stock manager is permitted to operate within the middle price range of the Agreement, i.e., £780 to £830 per ton. Whilst no change in the export quota was in accordance with recent market opinion, the decision regarding the buffer stock manager's authority came as a surprise and in this connection it will be recalled that under the Agreement the manager is enabled to buy between £730 and £780 and to sell between £830 and £880.

As yet it is early days to assess the effect which this step will have in the long run on the market; the main body of opinion inclines to the view that the immediate impact on nearby positions will be upward. Tin shipments from Penang in April amounted to 4,392½ tons compared with 6,356½ tons in March, whilst comparative figures for Singapore were 6½ tons against 5½ tons.

On Thursday the Eastern price was equivalent to £789½ per ton c.i.f. Europe.

#### LEAD-ZINC LITTLE CHANGED

Lead and zinc have again been lacking any feature of note. In Europe generally, consumer interest is maintained at a satisfactory level and although in the case of lead stocks in producers' hands continue to rise, which is only to be expected in view of the voluntary restrictions of supplies to the open market, in the case of zinc the general position is satisfactory.

In the U.S., lead demand has been at a slightly lower level than in recent weeks, whilst zinc is quiet, particularly in the case of special high grade for the die-casting industry.

Closing prices are as follows:

	April 28		May 5	
	Buyers	Sellers	Buyers	Sellers
<b>COPPER</b>				
Cash	£259½	£260	£258½	£259
Three months	£246½	£247	£246½	£246½
Settlement		£260		£259
Week's turnover	12,650 tons		10,500 tons	
<b>LEAD</b>				
Current ½ month	£77½	£77½	£77½	£77½
Three months	£76½	£76½	£76½	£76½
Week's turnover	9,225 tons		5,725 tons	
<b>TIN</b>				
Cash	£793½	£794	£791	£791½
Three months	£784	£784½	£787	£787½
Settlement		£794		£791½
Week's turnover	770 tons		905 tons	
<b>ZINC</b>				
Current ½ month	£94	£94½	£94	£94½
Three months	£90½	£91	£91½	£92
Week's turnover	7,375 tons		4,325 tons	

## COPPER • TIN • LEAD • ZINC

(From Our London Metal Exchange Correspondent)

The main interest this week has been focused on the latest developments in the copper market, whilst lead and zinc have been without any features of note and trading in tin has followed an irregular pattern. The tone of the markets generally, however, remains consistently steady.

#### UNCERTAIN CHILEAN SITUATION OVERSHADOWS COPPER MARKET

Once again strike action in one of the world's main producing centres and the consequent uncertainty resulting from rumours and counter-rumours accompanied by generally conflicting reports forms the background to the copper market. The threatened walk-out by workers at Anaconda's El Salvador mine and Potrerillos smelter took place early on Monday morning following failure to reach a new wage agreement to replace that which expired on April 30. This action was delayed mainly at the request of the official mediator in a last minute effort to bridge the gap, which by then had narrowed to a difference of 5 per cent between the 55 per cent wage increase offered by the company and the 60 per cent claimed by the union.

Meanwhile, however, negotiations had broken down when it transpired that the company would insist on the deduction of certain allowances from their offer which, in effect, would reduce the increase to the equivalent of 48 per cent. There the matter rests at present. Distinct possibilities now exist that sympathetic strikes will be called at the Chuquicamata and El Teniente mines where labour contracts expire on September 30 and December 31 next respectively and workers' representatives were due to meet at Santiago in the middle of the week to discuss the next

move. The general opinion is that this will not take the form of an indefinite walk-out but rather 24-hour stoppages at each plant.

As a result of the uncertainty of the Chilean picture, the market was hesitant during the early part of the week with consumers inclined to stand back but more recent developments in the situation stimulated some Continental demand with prices inclined higher. To a certain extent sentiment has been held in check by the rise last week in U.K. official warehouse stocks of 975 tons. This was substantially more than expected although it is doubtful whether more than about 300 tons of the increase represents metal actually available for the market.

In the U.S., customs smelters report physical copper continues to move only slowly domestically and during the week the export market has turned noticeably quieter. The main producers, however, appear on balance well satisfied with their sales of May metal and it is anticipated that June books will be opened in the very near future. Brass mills report some improvement in trade and indications point to May business being at a better volume compared to April but this is no more than the usual trend. The U.S. scrap copper price basis No. 2 wire remains steady at 24.75 c. with offerings on a limited scale following the upsurge in business after the downward reaction in the London quotations at the end of last week.

#### TIN QUOTAS UNALTERED

The tin market has been very sensitive with the cash quotation particularly volatile pending the outcome of the meeting of the International Tin Council which opened in London on Monday.

## The Problems of Rio Tinto

The annual report and chairman's statement of Rio Tinto cover such a diverse area of the world's mining activities that the commentator finds it difficult to know where to start. It is probably best to get the gloom out of the way first. And this, of course, means Canadian uranium. In the days when the American and United Kingdom governments were scrambling for this nuclear age metal Rio took a major stake in the crash programme to exploit Canada's production potentialities as quickly as possible. Unfortunately the governments concerned have now found that they have more than enough uranium, and Canada is thus having to stretch out its deliveries over a longer period.

This has hit the producing industry hard. Moreover, it is fully realised that when the new contracts end in 1966 there is likely to be a very tricky sales period indeed. Last year the Tinto chairman, Mr. Gerald Coke, estimated that by about 1970 demand for the metal should have overtaken the accumulated excess of supply. Now he qualifies this by adding the words "or by 1975 at the latest".

Tinto has two main problems in Canada. The first, re-organising their mining programme to suit the needs of the new situa-

tion, they have already faced in the scheme to amalgamate four of their mining companies there into a single entity, Rio Algom. This should take place very soon. Unfortunately the uranium shares involved are quoted in New York. This means, strangely enough, that by the rules of the Securities Exchange Commission there Mr. Coke is not allowed to give profit forecasts for Rio Algom. So we have to be content with the fairly confident prediction that the single concern will do better than its constituents would have done in the new circumstances and the indication that Rio Algom should pay a dividend next year.

### WRITING DOWN URANIUM SHARES

The second Canadian problem is the low prices at which the uranium shares are standing. This means that their market value is below that at which they appear in the balance sheet of Tinto's Canadian subsidiary, the Rio Tinto Mining Company of Canada, while the latter's shares stand somewhat below the figures at which they are taken in the parent company's accounts. If there is no recovery some writing down

will obviously have to be done. Tinto, however, are adopting a wait and see policy. They are doing this on the theory that prices are unduly low at present. Mr. Coke thinks that the public generally and shareholders in particular have been led to take a rather more gloomy view of the uranium financial picture than is perhaps warranted. One gathers the impression that the board think, or hope, that eventually very little, if any, writing down will have to be done.

Before leaving uranium, it is worth noting that the group's Australian venture, Mary Kathleen, is doing well. It is now declaring dividends quarterly and has so far paid two of 1s. Australian each for 1960. And so to gold and Rio Tinto's acquisition of Cam and Motor, the Southern Rhodesian producer. This cost £2,475,000 and has taken place since the end of the year. Mr. Coke now reveals how it has been financed partly from the sales, at prices greatly in excess of present ones, of some of Tinto's Northern Rhodesian copper shares, principally Rhodesian Anglo American, and partly from cash or the sale of short-dated securities. The operation leaves the holdings in Rhokana and Nchanga "virtually intact". Diversification and some tax advantages are the reasons for this switch. It looks as though it should not make any dent in the company's investment income.

### FUTURE DIVIDEND POLICY

Rio Tinto's profits and dividend for 1959 were discussed here on April 15. An increase in income from the Rhodesian coppers and Mary Kathleen was partly offset by lower revenue from Kern Oil, the Pyrites Company Inc. and from sulphur in Spain. With the 2s. dividend covered twice by earnings, excluding those of the Canadian subsidiary, there certainly seems to be no danger of anything less being paid this year. The future distribution outlook is governed very much by Board policy.

As Mr. Coke points out, both in Canada and Australia substantial profits will be earned over the next five or six years which will be free of tax in their country of origin under tax concessions granted by the respective governments. Remittance of these profits to London would attract full tax in the U.K. because there would be no overseas tax to offset under the Double Tax Convention. The board will thus have to hold a delicate balance between the attractions of re-investing these funds in their tax free form and the "justifiable demands of shareholders for some proportion of the revenue currently derived from the investment of their existing funds." It is reasonable to suppose that if all goes well the Board's policy will incline towards some increase in distributions. Tinto stand at 35s. cum dividend. They touched 59s. last year. The yield is 5.9 per cent. In the long run they may well prove to be too low at their present level.

### HIGHER LEAD-ZINC PROFITS

The effect that last year's rise in the zinc price—the price of lead was a little lower—had on the profit-earning capabilities of the producers, in 1959, has already been shown by the Rhodesia Broken Hill results. It is further illustrated by the preliminary announcements for 1959 of New Broken Hill, the Australian producer, and of Consolidated Zinc which combines a 32 per cent stake in two of Australia's major mines, including New Broken Hill, with a wide spread of industrial interests in the Commonwealth and also in the U.K. where

## LONDON MARKET HIGHLIGHTS

After a cautious opening on Monday, South African Gold share prices moved ahead on Tuesday and Wednesday. Business remained very small, however, but at least there was also very little selling. The generally excellent April profit figures had a good deal to do with the improvement in Kaffirs, particularly as they underlined the fact that the recent racial disorders have by-passed the mining properties.

Yet another outstanding earnings performance by West Driefontein was mirrored by an advance of 6s. 3d. to 171s. 3d. in the shares. Hartebeestfontein (52s. 6d.) responded to the sharp recovery in April profits and "Ofsits" improved to 78s. 4½d. in tune with the generally happier tendency. A feeling that the currently depressed price of Western Holdings (127s. 6d. against 187s. 6d. earlier this year) may have largely discounted the political problems in the Union brought in a fair amount of call option buying in the shares.

Finance stocks joined in with the improvement, Anglo American rising to 157s. 6d. Investment demand in a market none too well supplied with stock lifted Central Mining 2s. 6d. to 70s. 7½d. and Union Corporation revived at 55s. in anticipation of the annual report.

Materialization of a strike at the Chilean El Salvador and Potrerillos properties caused some firmness in the metal price and also in the Rhodesian share market. Investment demand lifted Chartered to 83s. 6d. and with the aid of some Cape buying Nchanga moved up to 59s. 4½d. Selection Trust became a strong market at 96s. 10½d. on hopes of a good final dividend and

Messina moved up to 110s. in anticipation of the interim due shortly.

The Lead-zinc market was cheered by some very good results—which included higher dividends—from New Broken Hill and Consolidated Zinc. But perhaps the news had been largely discounted in share prices because New Broken Hill after rising 1s. to 48s. quickly met with profit-taking and two days after the results stood at only 45s. 6d. Consolidated Zinc hardly improved at all on their results and later eased to 73s. 6d. in sympathy with the dullness of Industrial sections. Oddly enough, it was left to an outsider to provide any real improvement, the share being Rhodesia Broken Hill which gained 10½d. to 10s.

Tins remained firm enough. There was a good deal of uncertainty about which way the metal price is likely to move when the buffer stock manager's authority to operate in the £780 - £830 a ton range ends on July 1. But when the Metal Exchange greeted the news with a higher tin price share quotations hardened.

Idris Hydraulic were a curiously firm market, rising 3s. to 13s. in a few days for no very obvious reason. Dealers remembering the Gopeng-Tekka bid wondered if a new take-over deal was in the offing but no confirmation of this could be obtained. Ayer Hitam reached a new record price of 85s. and Gopeng moved up to 23s. while Ex-Lands jumped 7½d. to 3s. 3d. following the report. Elsewhere, the latest high development values lifted Ashanti to 20s. 4½d.

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it owns the Imperial Smelting Corporation. New Broken Hill's net profit of £796,238 is £319,921 higher than in 1958. The dividend, with a final of 1s. 6d., is brought up to 2s. 3d. tax free from the previous year's 1s. 4d. tax free. It requires the payment of £549,240. The rest of the 1959 surplus is devoted to a transfer of £245,000 against £150,000 to mine amortization reserve, leaving the carry-forward little changed at £362,380.

Consolidated Zinc's net profit is up by just over £1,000,000 at £2,663,267 and the dividend, with a final of 2s. 9d., is brought up to 4s. per £1 share on a capital of £10,185,696 compared with 3s. on a capital of £8,730,596 for 1958. Last year's payment, including that on the Preference shares, takes £1,456,709. General reserves get £50,000 more at £950,000 and on this occasion there is a transfer of £280,000 to exploration reserves. The carry-forward is a small amount higher at £1,090,254.

The present price of zinc is £94 a ton. The 1959 average London price was £82. Lead is now £77 against £71. New Broken Hill should thus be continuing to do better in the current year. Especially as there is now considerably less need to restrict production owing to the improved world statistical position of the metals. Consolidated Zinc will be benefiting from the lead-zinc producers' greater profitability as well as from the high level of industrial activity in Britain. The 1960 dividend trend could thus also be upwards.

The full report of Consolidated Zinc is to be posted to shareholders on May 30. It will be eagerly scanned for further news of the giant Australian bauxite project in which the company has a 50 per cent interest along with British Aluminium, now controlled by Tube Investments. On the whole it looks as though both Consolidated Zinc £1 shares and New Broken Hill 5s. shares are promising holdings at their current levels of 73s. 6d. and 45s. 6d. respectively. The yields after allowing for the dividends included in the prices are 5.6 per cent for Zinc and 8.3 per cent for N.B.H.

## CHARTERED'S RISING ROYALTIES

The British South Africa company's revenue from Northern Rhodesian mineral royalties continue to rise. In the March quarter, after allowing for the 20 per cent that goes to the government of that country, the income from this source was £3,076,000 compared with £2,670,000 in the December quarter and £2,500,000 in the March quarter of last year. This means that in the first half of its current financial year to September 30 next Chartered has received royalties of £5,746,000 against £3,989,000 in the same period of last year and £9,395,827 for the whole of that year. If it is assumed that there will be no diminution in the company's investment revenue which brought in £2,218,942 in 1958-59 there is a good pointer here to the possibility of higher overall earnings for the current year. This is especially so as the copper price on which the royalties are based via a sliding scale formula keeps up well and indicates a likely maintenance of the royalties in the June quarter.

Chartered 15s. units have come into investment demand following the quarterly and have rallied to 83s. 6d. This is still far below the peak 119s. 6d. reached earlier this year before the racial troubles in South Africa threw a shadow over the investment picture throughout Africa. The current yield on last year's dividend of 6s. is 7.2 per cent. It is difficult to regard the units as other than very reasonably valued by any normal investment criteria.

## Company News

Plans have been made to widen the range of products handled and to market all articles manufactured by the Fleming/B.A.O. Group of Companies which are intended for industrial consumption, through one subsidiary, to be known as Optoshield Limited, with effect from Monday, April 4, 1960. Mr. C. J. Williams has been appointed general sales manager of the new company.

The Dowty Group's stand at the British Trade Fair in New York, from June 10, to 26, will show a representative selection of their products, ranging in size and application from a bomber aircraft undercarriage to a hydraulic pit prop. The list of items of interest in the mining industry includes demonstration rig of the Dowmatic drive, a hydrostatic transmission system suitable for all heavy-duty agricultural and industrial vehicles, etc.; pump and motor as used in the Dowmatic drive; the Roofmaster self-advancing roof support system for long wall mining; and the Roofmaster minor.

Joy-Sullivan's Air Power Division have published the first issue of their Division newsletter "Air Power News" available on request from the company.

A bulletin has just been released covering the Lorain Moto-Loader Model ML-157 with 7,000 lb. carry capacity, and is available from The Thew Shovel Co., on request.

An illustrated brochure containing full details of Nyloc self-locking nuts is now available on request from Simmonds Aerocessories, Ltd., a member of the Firth Cleveland Group and their officially appointed stockists.

Edgar Allen and Co., have announced that the parent company and one of its subsidiary companies, Buell Ltd., have recently obtained orders for a mineral processing plant for drying china clay from filter presses.

Sir Robert McAlpine and Sons has operated its own fleet of business aeroplanes for about 14 years. Last year McAlpine decided to make this experience available to the whole of British industry as an advisory service on business flying. This decision linked up with agencies for the sale of several types of light aircraft and a contract to handle all servicing in the United Kingdom of Piaggio executive aircraft at their Aviation Division's Luton headquarters. The McAlpine service can advise on the purchase price, operating costs, maintenance, modification and documentation of nearly two dozen executive aircraft, short-list pilots and, if necessary, take over the whole operation and maintenance of the aircraft chose. To help companies which would like to have a trial operating period before deciding to purchase their own machine, McAlpine Aviation will also lease an aircraft, complete with pilot, for a 12-month period at a set fee for a block of several hundred flying hours.

## Personal

Mr. J. G. Mighell, sales manager of Mandoval Ltd., which is under the management of the Rio Tinto mining group, has left Britain for an extensive sales and development research tour of Mediterranean and Middle East countries.

Mr. W. Brining, F.C.A., was elected president of the Aluminium Development Association for 1960/61. Mr. Brining represents the Almin Group of Companies on the A.D.A. Council. Mr. R. Hain, who represents the Association of Light Alloy Refiners and Smelters, was elected vice-president.

Dr. J. Bell, manager of the I.C.I. Nobel Division silicones department has been appointed to the Division Board in succession to Mr. F. B. Wrightson, engineering and technical director, who retired on April 30.

The board of directors of Holman Bros. announce that on attaining the age of 65, Mr. P. M. Holman, the chairman and joint managing director of the company, has relinquished his office of joint managing director as from April 2, 1960, but will be remaining on the board and will continue as chairman.

At the annual general meeting of the British Rubber and Plastics Belting Manufacturer's Association. Mr. David D. Marshall of the Greengate and Irwell Rubber Co., was re-elected chairman for 1960-1961.

Mr. George M. Bassnett has been appointed director of European operations for The Thew Shovel Co. of Ohio, and managing director of Lorain-Holland N.V. of The Hague, a wholly-owned Thew subsidiary.

Mr. William Thomas Dunne was appointed a director of Malayan Tin Dredging and Southern Malayan Tin Dredging with effect from May 1.

Mr. Henry S. Wingate, president of the International Nickel Co. of Canada, has been elected chairman of the board and chief officer of the company. He succeeds Dr. John F. Thompson, who retires as chairman having served the company for 53 years, and as chairman of the board and chief officer since 1951. Dr. Thompson becomes honorary chairman, and will continue as chairman of the executive committee. Mr. J. Roy Gordon, executive vice-president since 1957, has been elected president of the company in succession to Mr. Wingate. Mr. Ralph D. Parker has been elected senior vice-president.

Mr. Stanley Wickett has retired from the Board of Gopeng Consolidated.

Mr. Howard S. Strouth has been elected to the board of Standard Magnetite Corporation; Mr. Strouth is the founder and former president of Stanleigh Uranium and president of Andacollo Mines, in Chile.



# RIO TINTO

## ACCUMULATION OF OPERATING PROFITS OVERSEAS

### BRITISH MINING ENTERPRISES FRUSTRATED BY TAX LAWS

The 87th Annual General Meeting of The Rio Tinto Company Limited will be held on June 2 at Barrington House, 59 Gresham Street, London, E.C.2.

The following is the statement by the chairman, **Mr. Gerald Coke**, which has been circulated with the Report and Accounts for the year 1959.

#### Accounts

The form of the Accounts is the same as that adopted for the last two years. The figures for the Canadian company are once again not consolidated but are shown separately in the Report and Accounts.

The income for the year includes an increase in the receipts from your Company's holdings in the Rhodesian Copperbelt and in Mary Kathleen Uranium, which is partly offset by lower income received from the Kern Oil Company, The Pyrites Company Inc. and the Compañía Española de Minas de Rio Tinto, S.A.

The Auditors have drawn attention in their report to the fact that the market value of your Company's investment in The Rio Tinto Mining Company of Canada is very little above book value. The decrease of some £4½ million since 1958 and the further decline in value which has since taken place results primarily from the continuing uncertainty of the market for uranium shares. In the Canadian Accounts a similar position arose regarding uranium investments and the Auditors felt it necessary to qualify their report, because the market value was substantially less than cost.

The profit figure of £3,914,000 before taxation includes the consolidated profits of Mary Kathleen Uranium which are free of tax in Australia and which would only attract British tax if remitted. Consequently the figure of £1,216,000 shown as tax on profits for the year is substantially lower than it would otherwise have been.

Although Canadian profits are not consolidated, a similar taxation problem would arise if any dividends were remitted to the United Kingdom out of uranium earnings and this position in regard to tax raises important issues of policy.

Both in Canada and Australia substantial profits will be earned over the next five or six years, which will be free of tax in their country of origin, under tax concessions granted by the Governments of the countries concerned. Briefly, these concessions, which provide that no tax is payable for certain specified periods, are intended to give the company an opportunity of amortising to a large measure the cost of its plant and equipment.

The effect of this is that, while the companies have the benefit of being able to accumulate tax funds to replace the wasting assets inherent in their operation, these moneys if remitted to this country would bear tax here, since the Double Tax Convention only permits the offset of tax to the extent that tax has been paid in the country of origin.

The accumulation of funds in the manner described above has the advantage of enabling the company to replace its assets by other revenue-bearing investments: and your Board, in considering future dividend policy in so far as it relates to the parent company, will have to weigh up, on the one hand, the value of extending their field of profitable operations out of tax-free revenue and, on the other, the justifiable demands of shareholders for some proportion of the revenue currently derived from the investment of their existing funds.

These tax concessions are, of course, intended to benefit and encourage the operation of mining enterprises in the Commonwealth. They are a recognition by the Governments concerned of the fact that in the field of metal mining large expenditures have to be undertaken and a considerable time-lag occurs between exploration and economic opera-

tion, but their effect is frustrated in the case of any mining house based on London by British tax laws. It is hoped that the British Government will give earnest consideration to the alleviation of a situation which places a British company at a disadvantage against one operating in other countries of the Commonwealth. It is indeed urgent that they should do so if London is to retain its importance as a base for mining finance business and if engineering and other industries, which look to mining for outlets for their products, are not to lose valuable customers.

#### Spain

In last year's Chairman's Statement a warning was conveyed that the trend of sulphur prices was downwards and that this would affect the profitability of your Company's investment in Spain. This forecast was in fact borne out by events and your Company received a lower dividend from Compañía Española de Minas de Rio Tinto during the year. The declared dividend was further reduced in value in your Company's hands by a devaluation of the peseta. The happy relationship between the two companies continues and our Spanish colleagues are to be congratulated on maintaining the mine at a high level of efficiency.

The late Mr. L. C. Hill's place on the Board of Compañía Española de Minas de Rio Tinto has been taken by Mr. R. F. St. G. Lethbridge.

#### Australia

Mary Kathleen Uranium paid its first dividends during the year amounting to A.2s. 9d. per stock unit. The mine is operating most satisfactorily and has substantially improved on the estimate of costs and profitability made when the

	1959 £	1958 £		1959 £	1958 £
Net profit after deducting minority interests and providing for amortization of Kern's oil reserves: Group (excluding Rio Tinto Canada and subsidiaries) ...	1,847,000	1,470,000	Proportion of profits of Rio Tinto Canada and subsidiaries attributable to Parent Company not included in Group Profit and not yet available for distribution as dividends ...	1,068,000	722,000
Appropriations			Less: Parent Company proportion of Intangibles written off and provision for depletion of investments	670,000	—
Capital Reserve ...	247,000	—		398,000	722,000
Reserve against Exploration and Development (including Parent Company appropriation of £175,000) ...	401,000	—	Balance brought forward from previous year ...	1,053,000	331,000
Net profit Parent Company ...	886,000	911,000			
Reserve against Exploration and Development ...	175,000	—			
Ordinary Dividend ...	894,000	*894,000			
At the rate of ...	20% less tax at 7/9	20% less tax at 7/9	Balance Carried Forward	£1,451,000	£1,053,000

\* Includes Special Interim Dividend on Ordinary Stock of 5% less tax at 7/9 (£223,000) paid in 1959.

mine was started. Our gratitude is due to our Australian colleagues for these results, which reflect the energy and imagination which they have brought to their task.

The problem of adequate water supply is still proving intractable and it has been decided to construct a second dam to minimise the risk of water shortage in a dry period.

Examination of a number of projects continues and it is hoped that by next year there will be something of substance to report.

### Africa

The opportunity to diversify functionally the Group's activities in Africa was presented by the chance to acquire the Cam and Motor Mine from the shareholders and an offer was made at 11s. per 2s. 6d. share, which was accepted by over 90 per cent. of the shareholders. Steps have been taken since the end of the year to exercise the right to acquire the remainder of the shares, making the company a wholly owned subsidiary of Rio Tinto (Southern Rhodesia) Limited. This purchase has been financed in part by sales—at prices greatly in excess of those ruling currently—of some of the holding in the Copperbelt companies, principally of shares in Rhodesian Anglo American which is itself a holding company and, therefore, placed the shareholders of Rio Tinto at two removes from the actual producer. The remainder of the purchase price has been found from cash or the sale of short-dated securities, leaving the hold-

ings of the two principal producing companies virtually intact. Purchase of Cam and Motor besides giving the advantage to the Group of a holding in gold mining to diversify our metal interests, also presents tax advantages. Until this acquisition all exploration costs in Africa had to be met from the net income of our Copperbelt investments; the possession of an active mine means that there is a source of gross income against which a certain amount of exploration expenditure can be set off. The exercise of the options on Patchway and Big Ben has added two minor gold-producing properties to the Group.

As reported in the Review of Operations, Rio Tinto also acquired an interest in the Sandawana Emerald deposit in Southern Rhodesia. The emeralds so far disclosed are of high quality and, if the deposit fulfils its early promises, this small investment could yield substantial returns.

Since the end of the year Mr. Frank Byers, accompanied by Mr. Lethbridge, the head of the Technical Division, and Dr. Duncan Derry, the Group's Consultant Geologist, paid a visit to Africa to inspect the newly acquired properties and have reported favourably on Cam and Motor as a profitable investment.

The thanks of the parent company Board are due to the staff in Africa for their work during the year which has seen a considerable functional diversification of our activities in the continent. Your Board are happy in the assurance that, under the leadership of Brigadier Rowlandson, they will be eager to accept the new responsibilities falling to them.

### Canada

In November, 1959, the Canadian uranium industry was informed by their Government that an agreement with the United States Atomic Energy Commission had been concluded under which the options to purchase further quantities of uranium oxide after the conclusion of the present contracts in 1962/3 would not be exercised, but stretching out the present contracts to 1966. This agreement came as a considerable shock to the industry, especially as unofficial discussions had indicated that an arrangement more advantageous to the producers would have been possible. However, our Canadian colleagues, as the principal producers of uranium in Canada, set about to make the best of a bad job.

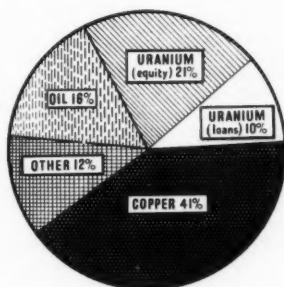
The Government agreement with the United States came at a time when the uranium mines were just coming to the point of really economic production; and Algom, in particular, was showing results which are a substantial improvement on the figures given in the prospectus at the time when the shares were issued to the public. The company was free of debt and a dividend of \$2.50 was paid in December. At the other mines also the initial problems had largely been overcome. During the year Milliken Lake and Northspan repaid bank and loan indebtedness amounting in the one case to \$7,600,000 and in the other to \$13,600,000. Pronto profits increased from \$2,716,000 to \$3,336,000.

Against this picture of reducing costs and improving results the Government agreement was especially unwelcome news. The situation which faced our

## The Company's Financial Interests in Minerals

### ANALYSIS OF ASSETS

These illustrations are based upon the Company's assets at book value or, where applicable, market value at the year end. They provide a diagrammatic analysis of the figures shown in the Accounts.

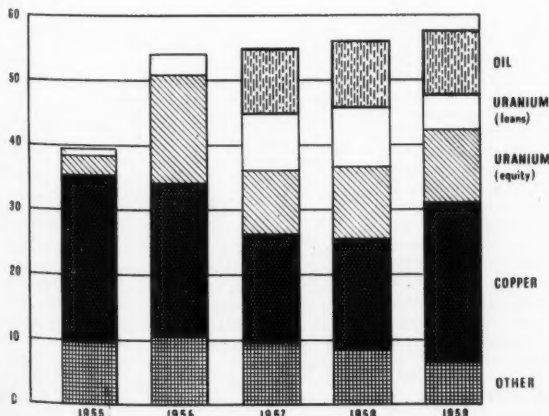


### ANALYSIS OF PROFITS

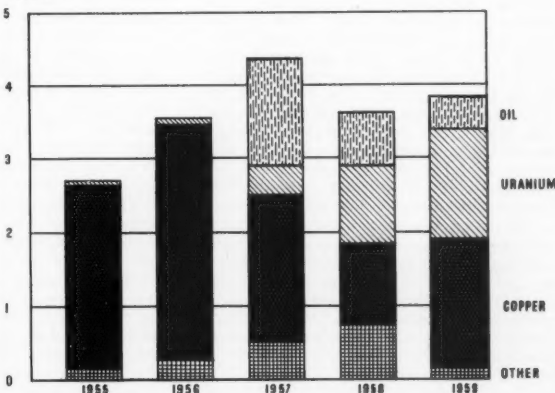
These diagrams are based upon the Company's consolidated profits before deducting taxation or amortization of oil reserves or adjusting special items. They include the Company's proportion of the profits attributable to The Rio Tinto Mining Company of Canada Limited.



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Canadian colleagues posed many serious problems, not only of a financial and industrial nature, but also in the sphere of labour relations and social policy.

The town of Elliot Lake is entirely dependent on the uranium industry and no alternative employment exists or can be easily created. The employees of all companies operating in the area had entered the industry, or the various services which depend upon it, in the belief, which had been fostered by politicians and public men on both sides of the Atlantic, that they were entering an industry of fundamental importance to the existence, even the survival, of mankind. To learn suddenly and without warning that the future of their industry was in jeopardy was—in the words of the Hon. Robert Winters, the President of The Rio Tinto Mining Company of Canada—a "severe jolt."

The Board of the parent company would like to pay tribute to Mr. Winters and to his colleagues in Canada, as well as to the leaders of the Trade Unions concerned and to many others who have assisted in devising solutions for the social problems involved. We hope and believe that everything possible has been done to soften the blow for our workers and their families and for other inhabitants of Elliot Lake whose own livelihood depends upon that of our employees.

Apart from the social implications, the task of rationalising the position of the uranium mines under the control of The Rio Tinto Mining Company of Canada was an extremely complex one. The solution which has been devised, and of which shareholders in these companies have been informed turned mainly upon two factors, the need to concentrate production in the mines having the cheapest costs and the need to take advantage of the tax position of the Northspan company, to which large tax credits accrue. The solution finally adopted is one which takes both these factors fully into account and, as shareholders are already aware sets up a new company, Rio Algom, which will combine in one unit all the producing mines under Rio Tinto control.

Rio Algom will be registered with the Securities Exchange Commission in the U.S.A. and under the rules of the Commission no forecasts of future profitability can be published by The Rio Tinto Mining Company of Canada. This together with other factors, has meant that the public generally, and shareholders in particular, have been led to take a rather more gloomy view of the financial picture than is perhaps warranted. Based on reasonably conservative estimates of costs—which it should be emphasised can now be confirmed by practical experience—the cash flow to the new company should be considerably greater than would have accrued collectively to the individual companies over the present contracts. This is due to the two factors mentioned above, namely that production can be concentrated in the two Algom mines, the cheapest producers in the Group, and that the amalgamation with Northspan and Milliken attaches considerable tax write-offs.

The amalgamation also attaches to Rio Algom the debts at present outstanding in all the companies forming the Group, and it is a condition of the amalgamation that no dividends can be paid on the equity until \$20,000,000 of the Northspan 5½ per cent. General Mortgage Bonds Series A have been repaid. This condition may delay the payment of dividends for about a year but

will not, of course, affect the total amount available over the six years.

The beneficial interest of your Company in Rio Algom will be about 20 per cent., held partly through a wholly owned Canadian subsidiary and partly through The Rio Tinto Mining Company of Canada.

At the end of the stretched-out contract period in 1966 the Group will possess assets which have been completely amortised and which should be capable of producing uranium as cheaply as any comparable mines anywhere in the world. Last year's Chairman's Statement included a review of the prospects for the future of uranium. The decision of the United States Government not to exercise their options on Canadian production brought to public notice the uncertainty which clouds the future of the industry, but it does not in itself make necessary a reassessment of its prospects. Other factors, some favourable, some unfavourable have, however, come to light since last year and it may, therefore, be worth while attempting, with many reservations, to bring up to date the forecasts then made. It was stated then: "Although the expansion of production which has taken place in the United States has probably been no more than sufficient to take care of the increased requirements of that country, the present position is that more uranium is produced than is currently required for consumption . . . . It would appear, however, that by about 1970 demand will have overtaken the accumulated excess of supply and thereafter—depending on a number of imponderables—there may be a shortage of the metal in the free world." It has become evident that there is some slowing down in nuclear energy programmes all over the world. This has been due in part to a reconsideration of traditional methods of power production, to the appearance of surpluses both of coal and oil and to a consequent cheapening of the cost of employment of traditional fuels, and in part to doubts about the cost of nuclear power based on estimates which assume among other things the pre-empting of the base loads by nuclear stations.

At the same time nothing has occurred to affect the calculations made by various authorities that, assuming only a modest growth of 3 per cent. per annum in the world demand for power, a serious energy shortage will have developed by the end of the century. It is doubtful whether, even over a fifteen or twenty year period, a 3 per cent. growth can be met by increased supplies of coal. Oil will undoubtedly play an increasing part in providing the world's growing needs, but for various reasons, including the fact that in the longer term burning oil is a wasteful and costly process compared with its use as a raw material for the chemical industry, it may be that in the field of electricity it will do no more than cover a marginal requirement. If the nuclear energy programme, in which research and development by their nature are bound to be long term, is to be in a position to meet this need, there is not much time for delay.

The defence demand is always an unknown factor but so far as can be determined it has not altered much in the last eighteen months.

On the supply side, Canadian production has been scaled down by about half by the stretch-out of contracts and the United States production by about 10 per cent. After 1966 it is quite likely that production will fall further, due to the removal of the shelter at present

given by the Government contracts to high cost producers.

When extensive reconsideration of the nuclear power position is taking place at Government level in all countries, it is not the time to make forecasts except with great reservations. The future holds many uncertainties in the uranium business, but it can still perhaps be stated that demand will have overtaken supply within fifteen years, and that last year's Statement quoted above still remains generally true if the words "or by 1975 at the latest" are added after "1970".

Both Mr. Winters, the President of The Rio Tinto Mining Company of Canada, and Mr. Blake Pelly, the Chairman of Mary Kathleen Uranium, in their addresses to shareholders have underlined in forcible terms the damage which the restrictive bi-lateral agreements, referred to in last year's Chairman's Statement, can cause to the commercial development of uranium. The Board of your Company would like to endorse as strongly as possible their remarks on this subject and to commend them to the attention of the Government's concerned.

Your Company in close consultation with its Canadian associate is taking all steps to reinforce its commercial position when a free market for uranium becomes a reality. Some of these steps are outlined in the Review of Operations; others are still being actively pursued. We are convinced that, given freedom from Government restriction, Rio Tinto as the largest producer in the Commonwealth can face any reasonable competition in the field of uranium.

## OIL

Our income from the Kern Oil Company was reduced by the lower crude oil prices which ruled throughout the year and by the need to continue expenditure on the search for additional reserves.

## Pyrites Company Inc.

The reduced price of cobalt and the United States steel strike both affected adversely the profits earned by The Pyrites Company Inc. and the income from this source included in the consolidated profits was reduced. Now that conditions have returned to normal and the plant is working at a higher percentage of capacity than was possible for most of the year, we are confident that Mr. Elmer Heubeck and his competent team will be able to produce results more satisfactory in terms of profits.

## The Board and Staff

There are no changes in the composition of the Board to report.

The task of keeping in touch with projects and operations in five continents falls almost entirely on the full-time members of the Board and the senior executives of the parent company. During the year Mr. Duncan, our Managing Director, has paid five visits to Canada and the U.S.A., as well as visiting India and the Caribbean. He has also been several times to the continent of Europe on business connected with the commercial exploitation of uranium or the affairs of our Spanish associate. The Board would like to express their gratitude to him for his willingness to undertake these lengthy and often fatiguing journeys.



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Mr. Saunders and Mr. Wright have between them visited Canada, the U.S.A., the Caribbean and South Africa, and Mr. Wright is at present in Australia. Mr. Byers' visit to Africa has already been referred to. The Board are confident that liaison with their overseas associates can only be satisfactorily maintained by visits from directors or senior officials, and they would like to record their appreciation of the trouble which their full-time colleagues and their senior staff have taken in this respect.

The Board are happy to thank, on behalf of all shareholders, the staff of the London Office for another year of loyal and diligent service.

*If you are interested in obtaining a copy of the full Report and Accounts please write to:*

The Secretary,  
The Rio Tinto Company, Limited,  
Barrington House,  
Room No. 61  
59 Gresham Street,  
London, E.C.2.

#### BURMA CORPORATION (1951) LIMITED

which operates a large Silver/Lead/Zinc Mine in the Northern Shan State, BURMA in a healthy sub-tropical climate invites application for the position of

#### ASSISTANT TO THE MINE SUPERINTENDENT

Applicant should be a fully qualified graduate of a reputable School of Mines preferably with a minimum of eight years practical experience in Mining, active, and capable of assuming control of the Mine Engineering staff, with some experience on the administrative side.

Experience in Square set mining useful but not essential.

Four years agreement: six months paid leave of which three months normally permitted after two years.

Contributory Provident Fund, Retirement Gratuity Scheme: free passages each way for self, wife and two children: plus free housing, medical attention, light and fuel and partly furnished quarters.

Salary, with allowances, aggregating K. 2,075 (£155 12s. 6d.) per month.

Advise fullest details education, professional qualifications, experience, age and family.

Write Box P. 520, WPS., Thavies Inn House, Holborn Circus, London, E.C.1.

## THE RANDFONTEIN ESTATES GOLD MINING COMPANY, WITWATERSRAND, LIMITED

(Incorporated in the Union of South Africa)

Statement to Members by the Chairman, Mr. D. A. B. Watson, on the Directors' Report and Accounts for the year ended December 31, 1959. (Issued to Members prior to the Sixty-seventh Annual General Meeting to be held in the Board Room, Consolidated Building, corner of Fox and Harrison Streets, Johannesburg, on Thursday, May 5, 1960, at 11 a.m.):—

#### Accounts

The profit for the year was £1,968,893 (1958—£2,077,711) after taking into account gold and uranium profits and other items of revenue and expenditure, and the interest paid on the loan for the uranium project but before providing for taxation.

Repayments on the Uranium Loans amounted to £695,478 (1958—£668,729). Taxation for 1959, excluding adjustments relating to the previous year, amounted to £531,800 (1958—£495,965) while dividends absorbed £812,711 (1958—£863,505). A further decrease in the value of stores on hand at the close of the year of £169,284 (1958—£182,525) permitted the transfer of a like amount from General Reserve to the Appropriation Account. After allowing for all the foregoing items, the balance carried forward on Appropriation Account was increased from £214,742 in 1958 to £329,337 at December 31, 1959.

This company's contribution to the cost of the uranium research programme, which is conducted by the Atomic Energy Board of the Union of South Africa, and which is designed to be of assistance to the uranium producers, amounted in 1959 to the substantial sum of £43,396 and will be of the order of £60,000 in 1960. This charge is admissible for taxation purposes, and, partly as a result of this factor, the tax payment for 1959 as compared with 1958 increased by an amount which was less than would otherwise have been the case.

The ratio of tax payable to profits earned will continue to increase in the current and future years as both the unredeemed balance of capital expenditure and the proportion of interest included in the fixed instalment loan repayments decrease.

#### Operations: Gold Division

The tonnage milled showed an increase of 104,000 tons over the figure for 1958 while the profit at £102,969 increased by approximately £30,000. It is expected that in respect of the gold division both the tonnage milled and the profit earned will be at a materially reduced rate for the year 1960.

Under present conditions it is unlikely that operations in the Gold Division can be continued on a profitable basis for more than a comparatively short period. Future operations will in general be confined to the extraction of the tonnage of ore remaining within the limits of the areas presently defined on the Kimberley Reef Series together with reclamation on the Main Reef Series.

It is not possible to say for how long mining on this basis can be carried on, but it is considered that operations can be continued at least during the current year, and thereafter for a limited period which would be materially affected by relatively minor variations in cost or recovery grade.

#### Operations: Uranium Division

The scale of operations was in general similar to that of the previous year. Tons milled in the Uranium Division totalled £1,957,000 in the year under review as compared with 1,870,000 in 1958 while working profit before interest and loan repayment was lower by some £60,000 at £2,121,201.

The total development footage accomplished increased slightly as compared with the previous year, the figures for the last five years being:—

1955	83,192 feet
1956	97,799 "
1957	122,563 "
1958	134,348 "
1959	142,409 "

It is likely that development during 1960 will be at a rate similar to that achieved in 1959.

Development on the Bird Reefs continued to reveal satisfactory values and ore reserves were improved as a result of an increase in both the total footage developed on reef and in percentage payability.

The scale of operations in the Uranium Division is governed by the quota of uranium sales allotted to this company by the Atomic Energy Board. It is expected that the quota applicable to this company for 1960 will not differ materially from that which applied during 1959.

#### Future position in relation to Uranium Sales

In the U.S.A. and in Europe opinions have lately been expressed that uranium supplies, in terms of existing contracts, are in excess of the present levels of consumption. It has further been suggested that stocks in the purchasers' hands are likely to increase to such proportions by the end of the existing period of those contracts that demand in the years immediately following will be at an extremely low level.

It was recently announced in Canada that the present contracts of Canadian uranium producers will not be renewed on expiry in 1962/3. In order to ease the situation thus created, Canadian producers have been permitted to extend the period during which the remaining quantity due under their existing contracts, will be delivered by deferring the expiry dates of the contracts from 1962/3 to 1966 and making certain consequential financial changes. They have also been permitted to merge contracts between individual producers to enable them if possible to rationalize production and reduce production costs.

The failure of present demand to match the supplies organized for delivery over the next five to six years in so far as it is related to non-military uses, does not appear to be attributable so much to any major set-back in the technical development of nuclear power, as to the fact that conventional fuels, which are in freer supply than was expected and which are being used in a progressively more efficient manner, have at present maintained their competitive position in relation to nuclear power. This delay in the closing of the economic gap in the relative costs of the two sources of power appears to be one of the more significant of the various factors in the slowing down of the current rate of installation of nuclear power units.

Under present circumstances, this company will complete its contract for the supply of uranium oxide by the end of 1964, and at that time there will remain within its property a considerable tonnage of uranium bearing ore, which, given current production costs and revenue, would be sufficient to enable the present scale of production to continue for some years thereafter. As pointed out above, however, present indications are that it is unlikely that there will be any significant demand for uranium for some years after the conclusion of the present contract. Moreover, current opinion is to the effect that if and when demand revives it is likely to be at a price lower than that received by your company under its present contract.

With regard to price, it has in previous years been explained to members that although at the present rate of production the grade of ore mined cannot be increased, nevertheless, by substantially lowering the rate of production in the post-contract period and by the selective mining which could be carried out under those circumstances, it would be possible to increase the grade of the ore mined and thus reduce the cost of production per pound of uranium oxide. In dealing with areas which have not been developed any forecast must of necessity be subject to reservations but on the basis of reduced production, even with the resultant raising of the pay limit and the consequential discard of large tonnages of presently payable ore, it is envisaged that a period of profitable operation might still be possible after the termination of the present contract even at reduced prices and that therefore a potential asset in the form of unworked ore *in situ* might at that time remain to be exploited.

If, however, it indeed proves to be the case that little or no demand exists for your company's product at the end of the present contract, even at a reduced price, then operations would cease and the mine would either be placed on a care and maintenance basis or more probably, closed down completely. Once a primary producer of the magnitude of Randfontein Estates has been closed down, it could not readily recommence operations at a later date. Apart from all other difficulties attendant upon reopening an old mine, the workings at Randfontein would in due course become flooded if operations ceased. It can be accepted that, if mining operations were to cease at Randfontein, then the uranium market would thereafter have to revive to an extent where it could give evidence of the probability of a firm and continuously maintained demand, at economic prices, before the inevitably substantial non-productive expenditure required to reopen the mine could be justified.

The directors are aware of the various circumstances affecting the future of your company and to protect its position will take such action as may be possible or desirable in the light of developments from time to time.

Representatives of the Combined Development Agency visited this country last February for discussions which are part of the pattern of periodic consultations which are held in connection with the sale of South African uranium to the Agency. Dr. Schumann, deputy chairman of the South African Atomic Energy Board, has stated in a press announcement that these discussions covered not only matters of importance connected with the existing contracts, but also reviewed the position which will arise at the end of the present contracts in the middle 1960's. Valuable information was exchanged and the parties to the contracts have a clearer appreciation and understanding of the problems involved.

No changes in the present contracts resulted from these discussions, but both the Atomic Energy Board and the Agency have agreed to give further consideration to the position and at a later date the discussions may be resumed.

Members will be informed if any material change should occur to affect the present arrangements.

The immediate outlook for Randfontein Estates is that operations will be maintained at the mine during 1960 at the scale dictated by the quota of sales. It is possible that uranium profits may be slightly reduced in comparison with last year, but such reduction, if it occurs, should not have a significant effect on profits available for distribution.

The profits available for distribution in the current year are likely, however, to be at a somewhat reduced figure because of the factors, referred to earlier, in the form of the

expected reduction in profit from the Gold Division, some increase in the tax liability and in the annual contribution towards the cost of the uranium research programme.

Although capital expenditure during the current year will probably be at a low level, certain major items of equipment will have to be renewed in the comparatively near future, and in order, *inter alia*, to meet anticipated future expenditure on such renewals, it is considered desirable to maintain a substantial balance in the Appropriation Account.

In conclusion I would like to place on record the Board's appreciation of the excellent services rendered by the General Manager, Mr. G. W. Holl, and the employees at the mine and the technical and secretarial staffs at the Head Office.

April 26, 1960.

## GOVERNMENT GOLD MINING AREAS (MODDERFONTEIN) CONSOLIDATED LIMITED

(Incorporated in the Union of South Africa)

Statement to Members by the Chairman, **Mr. D. A. B. Watson**, on the Directors' Report and Accounts for the year ended December 31, 1959. (Issued to Members prior to the Fiftieth Annual General Meeting to be held in the Board Room, Consolidated Building, corner of Fox and Harrison Streets, Johannesburg, on Friday, May 6, 1960, at 2.15 p.m.)

### Financial

During the year 1959 the net available funds arising from sales of gold, pyrite, redundant equipment and from sundry revenue, etc., amounted to £331,544 after providing for taxation and Government's share of profits.

Returns of capital to members amounting to £350,000, equivalent in all to 1s. 3d. per share, were effected during the year, and a further return of 6d. per share was made to members registered on March 15, 1960.

### Operations — Gold Division

Mining operations, together with the salvage of equipment no longer required for such operations, continued throughout the year and, in addition, gold was recovered from the treatment of old residues. The profit from gold mining, salvage, treatment of old residues and sundry revenue amounted to £23,851.

Operations have continued on a comparable basis during 1960 to date.

### Operations — Pyrite Production

Sales of pyrite concentrates for the year 1959 amounted to 189,052 tons, as compared with 191,932 tons during the previous year.

The pyrite was produced mainly from the treatment of slimes accumulated from gold mining operations in previous years and partly from the treatment of current slimes.

The tonnage of accumulated slime is more than sufficient to meet the require-

ments of the pyrite plant if operated at its present rate of output during the remainder of the period of the contract for the supply of pyrite to the South African producers of uranium oxide, which contract terminates towards the end of 1964.

Net revenue derived from sales of pyrite amounted to £276,940 after providing for the payment of interest on and redemption of the loans raised for the pyrite recovery plant. Present indications are that the profit earned during the current year will be similar to that earned during the year 1959.

### Future Policy

As mentioned in my statement to members last year the operation of the formula applicable to this company for the calculation of the State's share of profits is such that for a given level of profits, including that arising from the sale of pyrite, it is advantageous to continue mining operations and to incur expenditure thereon, even if no working profit results.

The Board is aware that if mining operations were to be suspended forthwith certain plant and machinery and other assets currently employed would be released for sale and disposal. The amounts realized from such disposal of assets would be small as compared with the amounts shown in the balance sheet under the heading of Mining Assets, and the major source of funds for future distribution to members is likely to be the profits arising from the production of pyrite. The deferment of the amounts which might be made available by the sale of assets employed in current gold production is of less significance than would be the increase in the State's share of profits, which would arise if gold mining operations were to cease. The policy of the Board at this juncture is therefore to continue the operation of the gold division for as long as possible. It is anticipated that the present scale of such operations can be continued during at least the current year.

**Pneumoconiosis**

It was stated in the Director's Report that the annual valuation of the Pneumoconiosis Compensation Fund as at March 31, 1958, revealed a surplus at that date, and, in view of the fact that this surplus was in excess of the annual levy on Group "A" controlled mines, this company among others was not required to make any levy payments for the year ended March 31, 1960. Valuation of the Compensation Fund as at

March 31, 1959, has now been completed and again reveals a surplus and no contribution by this company will be required in respect of the year ending March 31, 1961.

In conclusion, I would like to record the Board's appreciation of the excellent services rendered by the Mine Management and the employees of the mine, and by the technical and secretarial staffs at the Head Office.  
April 26, 1960

**FREDDIES CONSOLIDATED MINES, LIMITED**

(Incorporated in the Union of South Africa)

Statement to Members by the Chairman, Mr. D. A. B. Watson, on the Directors' Report and Accounts for the year ended December 31, 1959. (Issued to Members prior to the Sixth Annual General Meeting to be held in the Board Room, Consolidated Building, corner of Fox and Harrison Streets, Johannesburg, on Friday, May 6, 1960, at 11 a.m.)

**Accounts**

For the year 1959, the working loss on combined gold and uranium operations amounted to £66,484 (1958—£168,476). Net outgoings for the year after providing for capital expenditure, interest on loans, sundry revenue, interest received and other minor items amounted to £65,560 (1958—£202,509). Excess of Cash and Debtors over Current Liabilities at March 31, 1960, amounted to £64,472. During the year 1959 an amount of £200,000 was repaid to the National Finance Corporation; the balance of £600,000 due to that Corporation falls due for repayment between December 1960 and April 1961.

**Operations—1959**

Details of the operations conducted during the year 1959 are fully covered in the Directors' Report.

Production was at approximately the same level as that of the previous year in spite of continuous efforts to increase the rate of stoping. Development, which had been curtailed towards the end of 1958, was sufficient more or less to maintain ore reserves, while the average grade of the ore stoped at 312 inch-dwts. was in line with expectations. During the last quarter of 1959, however, the shortage of working face was aggravated by faulting and production suffered accordingly.

Nevertheless, the programme set out for 1959 was to a large extent fulfilled with the important exception that the fathmage stoped during the year did not increase by the 2,000 to 3,000 fathoms which, if achieved, would have eliminated working losses.

**Current Operations—1960**

Difficulties with regard to faulting and grade persist and production is now well below the required levels. The worsening of the position with regard to faulting and the consequential added difficulty of increasing the length of available stoping face is reflected in the considerable increase, in recent months, in the footage of development off reef which is required to make available one foot of development on reef.

The ratio between the footage "off reef" and the footage "on reef" has averaged six to one since the commencement of operations, which ratio, as has previously been pointed out to members, is considerably greater than the average for other mines in the Orange Free State. During the three months ended March 31, 1960, when the situation was particularly difficult the ratio rose to as much as eleven to one. Some improvement is, however, expected during the current quarter.

The total footage of development sampled during the first quarter of 1960 declined owing to the above factor, while the value of such reef development as was sampled also deteriorated from an average value of 302 inch-dwts. for 1959 to 255 inch-dwts. in the first quarter of 1960. To some extent this was due to a temporary inability to develop in certain of the better grade areas of the mine. This inability may partly be overcome during the quarter ending June 30, 1960, during which it is expected that the total footage developed on reef will also increase. Because of the decline in the value of the limited footage of reef development so far accomplished during the current year, the outlook in respect of the grade of ore which will be available for mining in 1960 remains unfavourable. A decline in the average value of the ore stoped during 1960 to at least a figure of the order of 290 inch-dwts, as suggested in the Directors' Report is more than likely, although during the first three months of 1960 the average value of the ore stoped was 309 inch-dwts. The full impact of the lower development values obtained currently and during the latter months of 1959 will not emerge until later in the year when it can be expected that the grade of ore stoped will decline as the stoping areas currently being developed are brought into operation.

Working losses during the quarter ended March 31, 1960, totalled £38,964.

**Immediate Outlook—1960**

It is clearly not possible to continue operations if losses of the above order are likely to continue. As pointed out in previous statements to members, no significant improvement in the position with regard to working costs or grade can be expected under current conditions. The position with regard to faulting has if anything deteriorated during recent months and the possibility of being able to increase production to the required levels has for that reason receded.

Circumstances are such, however, that there is a real possibility that production may increase during May and June and be maintained for some period thereafter at

the required levels, and it is intended therefore to continue during the next few months with the current efforts to bring this about. If no significant improvement is apparent during May, it will be necessary without further delay to reduce the rate of development to a level which will enable operations thereafter to be continued on a break-even basis. As stated in the Directors' Report, such a step must inevitably lead to a gradual reduction in the scale of mining accompanied by a further reduction in the level of development. The effect of these successive reductions in the rate of stoping and the rate of development is cumulative and it should be clearly understood that, if development has to be reduced materially below current levels, this reduction would almost certainly be a prelude to the ultimate closure of the mine.

Should it be necessary materially to reduce the level of development, operations will probably be continued for a period on the basis of extracting presently developed ore reserves, and completing the development of blocks of ore already partially developed. It is difficult to say for how long mining operations would continue on this basis, but it is reasonably certain that they could be continued for at least a year from the date of the decision to curtail development, should such a decision be taken.

**Elsburg Reefs**

The Chairman's Statement issued prior to the last Annual General Meeting referred to the fact that it was desirable, if it was financially possible, to drive a haulage towards the western boundary of the company's lease area in order to ascertain whether or not the Elsburg reefs, which are at present being developed by Loraine Gold Mines Limited in an area some 17,000 feet north of your company's lease area, persist in a southerly direction into the Freddie's lease area. It may be recalled that one borehole ERK1 drilled some years ago on the boundary of the company's property did indicate that the Elsburg Reefs might to some extent exist within the company's lease area.

During the year this haulage, known as the 18 North 2 Haulage West, was advanced some 2,400 ft. towards the western boundary. The haulage is being advanced as rapidly as funds permit and, irrespective of whether or not any overall curtailment of development proves necessary in the near future, present intentions are that this particular haulage will continue, in an endeavour to reach a position from which the Elsburg Reefs can be tested. It is hoped that by the end of 1960 it may be possible to determine whether there is any likelihood of these being economically exploited by the company.

**"B" Reefs**

Reference was also made in the Chairman's Statement last year to the possibility that some payable "B" Reef might be found in the neighbourhood of a borehole E.V.1 situated to the east of the North 2 shaft area. Although experience on other mines indicates that the value of the "B" Reef tends to be erratic, it was and is still considered desirable that, should circumstances permit, a haulage should be driven in the direction of borehole E.V.1 which lies some 3,500 ft. east of the nearest present workings of the mine. Work on this haulage was in fact started, but working losses incurred in recent months have prevented the continuance of this programme. It is still intended, should circumstances permit, to advance this haulage the minimum distance required to test



out the "B" Reef. It is felt, however, that if it is a question of a choice between one or the other then it is more important to prospect the Elsburg Reefs than the "B" Reef, and priority will be given to the former requirement.

#### Future Policy

In the Chairman's Statement issued to members last year, there were fully set out the various factors which had been considered by the Board of Directors in arriving at their decision to continue operations. It was pointed out, *inter alia*, that one line of action which could be followed was to close the mine and to dispose of the assets as quickly as possible. It was estimated that this programme, if followed, might release net funds of the order to £1,500,000 for distribution to members, which is equivalent to an amount of about 2s. per share. This position has again been reviewed and the current estimate of the net funds which might become available under these circumstances remains the same, i.e., about 2s. per share.

Another line of action which was considered by the Board was to close down the mine, to sell certain but not all of the assets, and to place the mine on a caretaking basis, awaiting future developments and a possible increase in the price of gold.

The reasons which guided the Board of Directors to decide not to adopt either of the above alternatives but rather to continue operations were fully set out in my statement last year. These reasons have been re-examined and appear still to be valid, and the Board of Directors remains of the same opinion namely that it is advisable to make every attempt to keep the mine in production for as long as possible, provided the assets of the company are not unduly diminished by following that line of action.

It is apparent from past experience that, although a break-even may currently be achieved, adequate profits can only be expected if there is a very significant improvement in the value of the ore mined or if there is at some point of time an increase in the price of gold. As stated in previous years, the history of this company's mine and the neighbouring mines to the north of it do not give grounds for expecting a general improvement in the value of the Basal Reef within this company's lease area. The additional work carried out by the company during the year 1959 tends to confirm this previously formed opinion. Although there appears to be little hope of any material improvement in the values of the Basal Reef in the vicinity of the areas currently being worked on that reef, it is nevertheless, as explained earlier in this statement, considered advisable to investigate, if possible, the potential value and extent of the Elsburg Reefs and it is therefore important, in the opinion of the Board, that operations should at this stage be continued in order to gain time to achieve this object.

It should, however, be made clear that although in the opinion of the Board this exploration should be carried out the likelihood of finding worth-while payable tonnages on the Elsburg Reefs within this company's claim area must be regarded as somewhat remote. Present evidence indicates that the tonnages of such reefs contained in any given claim area, and the value of such reefs, is likely to diminish as one moves in a southerly direction away from the deposits which have so far been encountered and are in the process of being exploited at the Loraine mine.

If any change is to be made in the current programme which is designed to continue operations on the present scale for as long

as possible, and should it be necessary to curtail development to a point which might endanger the continuance of such operations, members will be notified.

In conclusion, I would like to place on record the Board's appreciation of the able

The Mining Journal—May 6, 1960

and willing services rendered by the Manager, Mr. C. J. Shaw, and the employees on the mine and the technical and secretarial staffs at Head Office.

April 26, 1960.

## THE EAST CHAMP D'OR GOLD MINING COMPANY, LIMITED

(Incorporated in the Union of South Africa)

Statement to Members by the Chairman, Mr. D. A. B. Watson, on the Directors' Report and Accounts for the year ended December 31, 1959. (Issued to Members prior to the Forty-second Annual General Meeting to be held in the Board Room, Consolidated Building, corner of Fox and Harrison Streets, Johannesburg, on Thursday, May 5, 1960, at 2.15 p.m.)

#### Accounts

The profit for the year before providing for taxation amounted to £100,863 (1958—£92,874). Dividends paid amounted to £51,975 (1958—£51,975) and taxation amounted to £33,795 (1958—£29,250). The unappropriated profit carried forward was £30,135 (1958—£24,947).

#### Uranium Division

The results of the year 1959 compared with those of the previous year show little change in the tonnage milled, the quantity of uranium oxide produced and the rate of recovery per ton. Stopping operations on the Bird Reef series were carried out on both the Monarch Reef and the Footwall Reef. Two years' experience of mining the Footwall Reef indicates that, generally speaking, it has a considerably lower uranium content than has the Monarch Reef. A limited tonnage of payable Footwall Reef has, however, been exposed and is being exploited. Development continued on both the Monarch and the Footwall Reefs. The percentage payability of the development sampled decreased as compared with the previous year.

Reference was made in the Directors' Report for the year ended 31st December, 1957, to the inclusion within the company's mining title of an additional 64 claims situated on the south-western extremity of the property. It is now apparent that the major portion of this claim area, owing to the disturbed nature of the ground in the vicinity of the Witpoortje fault, will not be of economic interest and will not be exploited.

Development of the remaining claim area underlain by Bird Reef has now more or less been completed. Such development as is presently being carried out is largely confined to the highly faulted areas in the vicinity of the Witpoortje fault. This development, although making additional ore available for current operation, will not result in any additions to ore reserves which declined from 184,000 tons as at December 31, 1958, to 132,000 tons as at December 31, 1959. It is anticipated that operations will continue at the present milling rate during 1960, and

probably during 1961, and that the present level of profits will be maintained during the current year. It remains doubtful whether the company will be able to continue operations during the whole period of the uranium contract which terminates in 1964.

As mentioned in the Directors' Report, production by your company is not limited by the annual quota set by the Atomic Energy Board for the Randfontein Estates Joint Treatment Plant owing to the fact that your company does not utilise its full tonnage entitlement in that plant.

#### Gold Division

Reclamation operations in the old areas of the mine continued on a small scale. The quantity and the value of the reclamation ore available is however limited, and while it is intended to continue operations for as long as possible at the present rate it is unlikely that the profits earned from this source will be significant. Such profits as may be earned will be reported quarterly as in the past.

#### Pneumoconiosis

It was stated in the Directors' Report that the annual valuation of the Pneumoconiosis Compensation Fund, as at March 31, 1958, revealed a surplus at that date and, in view of the fact that this surplus was in excess of the annual levy on Group "A" controlled mines, this company among others was not required to make any levy payments for the year ended March 31, 1960. Valuation of the Compensation Fund as at March 31, 1959, has now been completed and again reveals a surplus, and no contribution by this company will be required in respect of the year ending March 31, 1961.

In conclusion, I would like to place on record the Board's appreciation of the able and willing services rendered by the Manager, Mr. C. Gordon Davis, and the employees on the mine, and the technical and secretarial staffs at Head Office.

April 26, 1960.

Editor of technical journal requires assistant with engineering background. Trade journalistic experience an advantage. Apply, The Secretary, Box 662, The Mining Journal, 15 Wilson Street, Moorgate, London, E.C.2.

by the  
employees  
secretarial

## Machinery and Equipment

# Submarine Blasthole Drilling

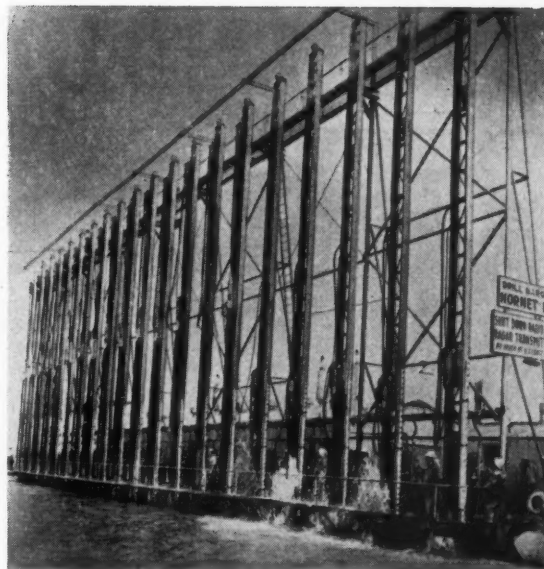
Submarine drilling techniques have been advanced recently as a result of work carried out by Joy Manufacturing Co., United States, on several channel deepening and widening projects.

The method involves equipping a barge with a number of Joy TM-500 drills powered by a suitable number of Joy WN.112 air compressors, each driven by a marine-cooled diesel engine. This barge and drill "package" may be adapted for submarine blast hole drilling to operations of various sizes.

In operation, the barge is anchored over the working area and becomes a self-contained drilling plant with a limited amount of mobility. Two cables are run out diagonally from each end of the barge and anchored at a distance of up to 800 ft. By winching in cable at one end of the barge while paying out at the other, it can be manoeuvred in accordance with a predetermined drilling plan. Spuds, or piles, one at each corner of the barge are lowered by an air-operated hoist to ensure a stationary and level platform for drilling.

Assuming a three-drill barge is used, with drills having an effective horizontal tracking distance of 80 ft., the operation proceeds as follows: Holes spaced on ten foot centres permit the sinking of nine holes from a single barge position, allotting three holes to each drill. Once a tower has been positioned for drilling it is locked in place by a quick-acting clamp and a sandpipe is lowered until it rests on the sediment or rock to be worked. The sandpipe functions as a guide for the drill steel, prevents

Alongside, at right, a multiple - drill barge having 20 fixed, equidistant drill towers. Below, diagram of a typical 3-drill barge arrangement

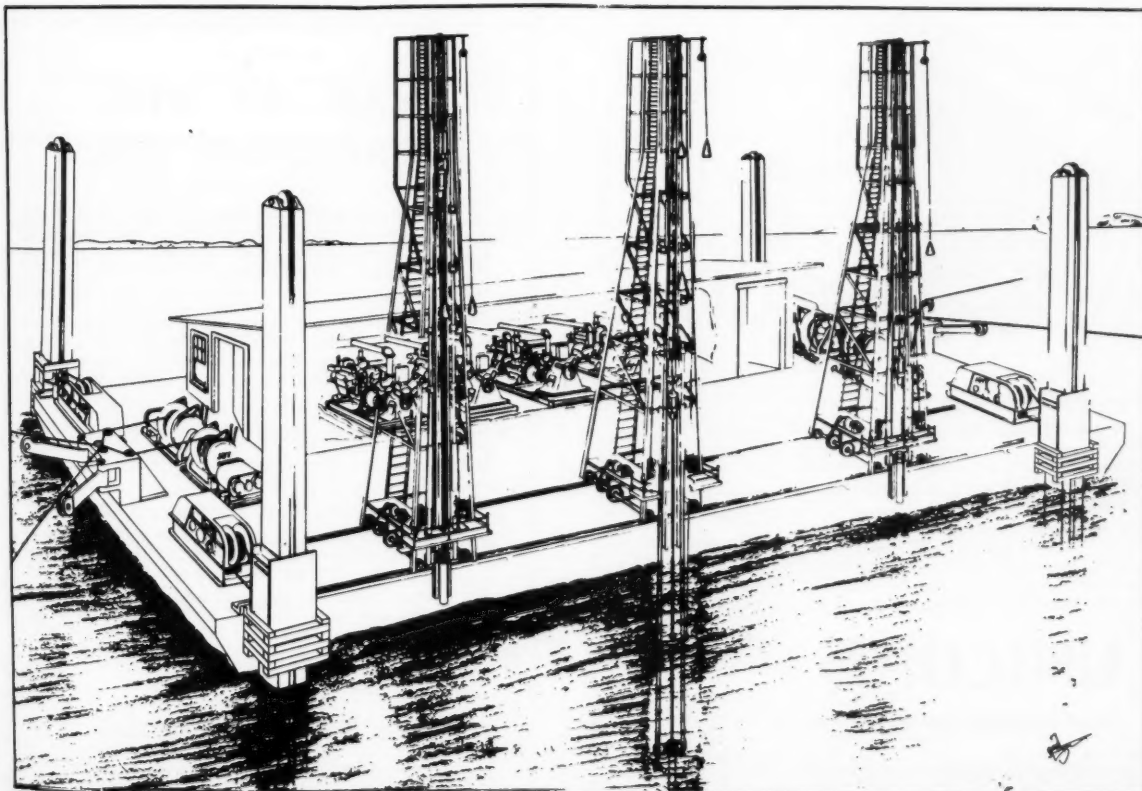


material from caving into the drilling, and also guides the charge into the hole for firing.

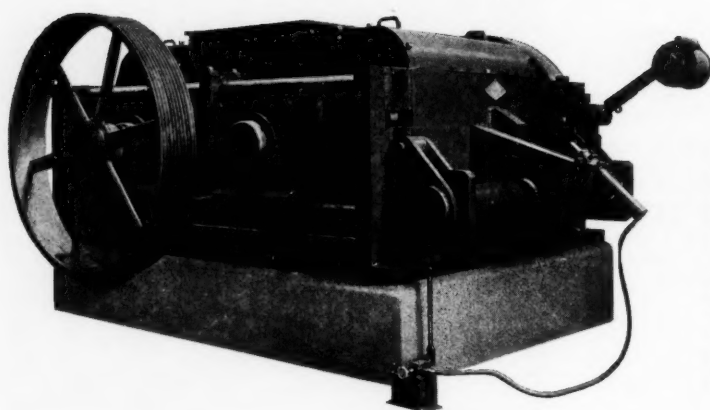
Drilling then proceeds in the normal manner, using air pressure to blow the holes. The drill is then raised in the tower and a dynamite loading tube lowered by air hoist down the sandpipe to the bottom of the drilling. The bottom stick of dynamite contains a detonator with a lead wire to the barge deck, so that after the charge has been ejected from the loading tube and

the tube withdrawn, the leads from all holes may be connected up. The sandpipe can then be raised and the drill tower moved to the next position where the process is repeated as above.

When all holes have been drilled and loaded, spuds are raised and the barge is warped by the anchor winches to a position approximately 180 feet from the blast area. After firing, the barge is warped back to the next drilling position where the entire cycle is repeated.



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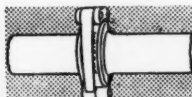
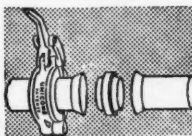
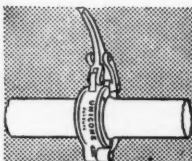
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